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Natural Resources and Conflict in Africa: What Do the Data Show?

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Natural Resources and Conflict in Africa: What Do the Data Show?¹

Sambit Bhattacharyya and Nemera Mamo²

16 May, 2019

Abstract: The empirical relationship between natural resources and conflict in Africa is not very well understood. Using a novel geocoded dataset we are able to construct a quasi-natural experiment to explore the causal effects of oilfield and mineral discoveries on intra-state armed conflict in Africa at the grid-cell level corresponding to a spatial resolution of 0.5 x 0.5 degrees latitude and longitude. We find no evidence of resource discoveries triggering conflict after controlling for property rights institutions, past discoveries, grid-cell and year fixed effects, grid-cell specific trends, and country-year fixed effects. Resource discoveries are associated with improved local living standards and increased political patronage both of which reduce conflict. We observe little or no heterogeneity in the relationship across resource types, discovery size, distance to discovery and borders, and institutions. The relationship remains unchanged at higher grid-cell resolution, and regional and national levels.

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Key words: Resource discovery; Conflict onset; Conflict incidence; Conflict intensity

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1 Introduction

Armed conflict has been part of human history since time immemorial. Eighteenth century political economist Thomas Malthus in his essay entitled *An Essay on the Principle of Population* noted that faced with resource scarcity, armed conflict is a key strategy for humans in their struggle for existence. Charles Darwin was also inspired by Malthus' work when he professed that conflict and competition over scarce resources are germane to the evolutionary strategies of species in their quest for survival in the natural world. Even though armed conflict is integral to the process of allocation of scarce resources, the interrelationship between the two is not very well understood. Provocative theories on the relative power of greed and grievances abound, the true causes of conflict in the resource rich regions of Africa remains largely unknown.

Until recently, research on the interrelationship between natural resources and intrastate civil conflict stood on the periphery of the economics discipline.³ The past decade however witnessed a surge in research on conflict. Indeed, a large body of macro cross-country literature documents positive relationship between natural resources and conflict.⁴ The emphasis is on the role of economic motives as opposed to social motives in triggering conflict. For example, access to an oil rig or a mine could provide lucrative financial opportunities to rebel leaders to build and sustain rebel organisations which would encourage armed conflict. This could override atypical social motives such as inequality, political repression, and ethno-religious divisions.

Establishing causality has been the key motivation in this literature. Chilling examples of conflict in Angola, Democratic Republic of Congo, Rwanda, Sudan and other resource rich regions of Africa often tempt scholars to argue that resources cause conflict. Yet establishing causality has remained illusory largely due to the obvious limitations associated with cross-country studies. Furthermore, lack of useful data for Africa limits the scope for adequately examining the causal link.

In this paper we aim to systematically explore the causal effect of oil and mineral discoveries on intra-state armed conflict onset, intensity, and incidence in Africa at the grid-cell level corresponding to a spatial resolution of 0.5 x 0.5 degrees latitude and longitude. Using detailed georeferenced data on resource (oil and mineral) discoveries and armed conflict, we are able to construct a quasi-natural experiment to establish causality. In other words, we are able to test whether resource discovery as an exogenous news shock has any bearing over conflict onset, intensity, and incidence at the local level in Africa. We also discuss the plausibility of channels through which natural resource discovery shocks affect the intra-state armed conflict. We use three different datasets containing the geographical location of conflict events in Africa: the PRIO-GRID conflict dataset, the Armed Conflict Location and Event Dataset (ACLED) and the Uppsala Conflict Data Program Georeferenced Event Dataset (UCDP GED). These datasets cover different time periods and countries. The three datasets allow us to use alternative definitions of armed conflict: onset, incidence, and intensity.

The paper makes the following contributions to the literature. First, the paper uses a novel geocoded dataset of resource (minerals and oil)⁵ discovery at the grid-cell level. This dataset have been used by Mamo et al. (2019) to examine the effects of mines on local living

³Note that *conflict* here implies *intra-state civil conflict*. We do not analyse the relationship between natural resources and interstate wars. For a recent study on oil and interstate wars see Caselli et al. (2015).

⁴See Blattman and Miguel (2010) and Nillesen and Bulte (2014) for a survey of this literature.

⁵The dataset includes copper, diamond, fluorite, gold, graphite, lead, manganese, mineral sands, nickel, niobium, PGE, phosphate, platinum, potash, rare earths, silver, uranium, zinc, zircon, oil and gas. The long appendix (Table A.1) presents additional descriptive statistics.

standards in Africa. Second, the study presents results on the effect of resource discovery on conflict using grid-cell level data and finds no statistically significant effect. This is a departure from the existing grid-cell level study of natural resources and conflict which tend to focus on the use of resource deposit values as a source of exogenous variation and report a positive effect (Berman et al., 2017). We do the same here by interacting discoveries with post discovery commodity price as a measure of expected discovery value and the results remain unchanged. Third, using discovery as a news shock we are able to track the heterogeneous intertemporal effects of resource extraction. Resource extraction is a stepwise temporal process involving discovery, construction, and production all of which could potentially have varying effects. The early effects of a discovery news shock are expectation induced whereas later effects are likely to be driven by actual revenue. We are able to make this distinction here and these results are new. Fourth, we use three different grid-cell level datasets on conflict in Africa and find consistent results across datasets. Fifth, we investigate the potential heterogeneous effects of natural resource discovery on armed conflict by the size of discovery, type of discovery, and time-varying proximity to the discovery yielding new results. Finally, our study is able to cover all African countries (including both North Africa and sub-Saharan African (SSA) countries) at the grid-cell level potentially offering credible external validity of the findings.

The popular discourse both within the academy and the press is that competition over resource wealth in Africa is the root cause of armed conflict. Several cross-national studies support this view (Collier and Hoeffler, 1998, 2004; Humphreys, 2005). Fearon (2005) and Brunnschweiler and Bulte (2009) however challenge this view. The positive association between natural resources and conflict is not borne out in our grid-cell level geocoded data. Contrary to some of the cross-country results, we find that oilfield and mineral discoveries significantly reduce the likelihood of intra-state armed conflict onset post resource discovery in a pooled cross-section set up with a sample of 48 African countries observed over the period 1950 to 2008. The effect remains negative but statistically insignificant or weakly significant in most specifications when we control for high dimension fixed effects (time-varying common shocks, grid fixed effects, grid-specific time trends, and country x year fixed effects) and property rights institutions. We observe little or no heterogeneity in the relationship across resource types (minerals or oil), size of discovery (giant or major), proximity to discovery locations and national borders, and quality of national political institutions measured by Polity2 score.

We also analyse the effect of resource discovery on armed conflict incidence and intensity using the same panel of countries covering the period 1989 to 2012. The smaller sample size here is due to the truncated temporal coverage of conflict data from ACLED (1997-2012) and UCDP GED (1989-2010). The effect appears to be statistically insignificant once we control for high dimension fixed effects.

We also perform numerous robustness tests and sensitivity analysis to carefully validate our results. First, we restrict our sample to observations where at least one oilfield or mineral discovery was made during the sample period in order to address the concern that observations with oilfield and mineral discoveries are different from others in ways that we cannot measure and control for directly (Lei and Michaels, 2014). Second, we restrict our sample to grids in which at least one conflict event occurred over the sample period. Berman and Couttenier (2015) refer to such grids as high-conflict-risk grids. Third, we apply buffer zone analysis in order to address the potential concern that oilfield and mineral discoveries could take up large geographies and hence influence the surrounding geographies of intra-state armed conflict. Finally, we also estimate the model using logit and Poisson regressions. The results remain broadly unchanged.

The obvious question here is via what channel resource discovery affects intra-state armed conflict. We find that resource discovery improves luminosity (or wellbeing) at the grid-cell level which in turn reduces armed conflict onset. This is a purely economic mechanism. Another plausible mechanism could be the distribution of political patronage by the state thereby dissuading citizens and elites from attempting armed rebellion. We also find support for this mechanism.

Our identification strategy relies on the exogenous variation in the discovery dates of oilfield and mineral deposits. Our dataset allows us to distinguish between giant and major discoveries. Even though it is possible to identify the area where minerals or oil are likely to be found using geological data, it is not possible to accurately predict the timing of giant and major discoveries (Arezki et al., 2017; Bhattacharyya et al., 2017; Mamo et al., 2019). Therefore, the discovery dates of giant and major reserves are likely to be exogenous. One might argue that politicians and government could manipulate the announcement of the precise timing of discovery. Our data is immune to such possibility as the discovery dates are independently verified and documented using multiple sources. More discussion on this follows in Section 4.

How random is resource discovery? Resource discovery could be a product of exploration effort and the latter could be influenced by pre-existing conflict and weak property rights. We present estimates with grid-cell level property rights, past discoveries, grid-cell and year fixed effects, grid-cell specific trends, and country-year fixed effects as controls. We use exclusion of an ethnic group from state power as a measure of property rights institutions at the grid-cell level. We also present estimates with ‘first’ and ‘single first’ resource discoveries which are rarer events than resource discovery. These issues are discussed further in Section 4.

Administrative boundary demarcation could be a potential source of endogeneity. For instance, administrative boundary demarcations in a country could be determined by political, geographic and demographic characteristics of the area. This could in turn be correlated with both local conflict dynamics and natural resource extraction contaminating the coefficient estimate. This is less of a concern here as our main unit of analysis is a grid-cell of resolution 0.5×0.5 degrees. The grid cell level data by construction is independent of political, geographic and demographic characteristics and therefore is exogenous to conflict and resource discovery. Nevertheless, we also check the effect of resource discovery on conflict at the 1×1 degrees resolution, region and country levels. We use 0.5×0.5 degrees resolution because it is common in the literature. See for example, Alesina et al. (2012), Michalopoulos and Papaioannou (2013), Berman et al. (2017), Besley and Reynal-Querol (2014) and Berman and Couttenier (2015).

Another source of bias could be the fact that mines and oil rigs are often military targets in a conflict giving rise to a positive association between the two variables without any actual causal link. Again, this is less of a concern here as we are finding negative or no association between resource discovery and conflict.

Our paper is broadly related to the resource curse literature. Auty (2001), Gylfason (2001) and Sachs and Warner (2001, 2005) note that resource rich countries on average grow much slower than resource poor countries. Subsequent studies have argued that natural resources may lower economic performance because they strengthen powerful groups, weaken legal frameworks, and foster rent-seeking activities (Tornell and Lane, 1999; Besley, 2007). Others have argued whether natural resources are a curse or a blessing depends on country-specific circumstances especially institutional quality (Mehlum et al., 2006; Robinson et al., 2006; Bhattacharyya and Hodler, 2010, 2014; Bhattacharyya and Collier, 2014), natural resource type (Isham et al., 2005) and ethnic fractionalisation (Hodler, 2006).

More specifically, our paper is also related to the literature documenting the effect of natural resource wealth and income on conflict. Recent theoretical studies argue that the likelihood of conflict is related to three key variables (Besley and Persson, 2009, 2011). The prize for the winner in a conflict is increasing in natural resource rent. Therefore resources increase the likelihood of conflict. Higher wages in contrast increases the opportunity cost of fighting and hence reduces the likelihood of conflict. Weak institutions and lack of state capacity to raise revenue compromises inclusivity of political institutions and hence increases the likelihood of conflict. In a nuanced general equilibrium model, Dal Bo and Dal Bo (2011) show that resource boom in the form of a favourable price or technology shock diminish wages and reduce the opportunity cost of conflict.

In spite of the apparent theoretical clarity, estimating the causal relationship between natural resources and conflict has been challenging. Several macro cross-national studies such as Collier and Hoeffler (1998, 2004); Humphreys (2005) and Bruckner and Ciccone (2010) report robust positive relationship between resource dependence and conflict.⁶ However, Fearon (2005) point out that these results cannot be interpreted as causal since they could be driven by omitted variables and endogeneity. Furthermore, Fearon and Laitin (2003) identify weak institutions as the main cause of conflict rather than natural resources.

Contemporary cross-national studies have used instrumental variables and exogenous news shocks to address endogeneity concerns and identify the causal effect. Miguel et al. (2004) use rainfall shocks as an instrument for economic shocks and find that negative economic shocks trigger conflict. Cotet and Tsui (2013a) and Lei and Michaels (2014) both use giant oilfield discovery as an exogenous news shock to identify the effect of oil on conflict onset. The former report no effect while the latter report a positive effect. Brunnschweiler and Bulte (2009) examine the effect of resource wealth and find that the same in fact reduce the probability of conflict. Overall the cross-country evidence is inconclusive.

Conflict is often localised and therefore local effects could be significant. Local level studies of natural resources and conflict are rare barring a few exceptions. Angrist and Kugler (2008) study the effects of upsurge in coca prices and cultivation on civil conflict in Colombia. Maystadt et al. (2013) study the Democratic Republic of the Congo and find that mineral concessions have no effect on conflict at the lowest administrative unit, but significant effect at the higher administrative units. More recently, Berman and Couttenier (2015) study how external income shocks affect the probability of conflict events in SSA by working with a full grid-cell of 0.5 x 0.5 degrees latitude and longitude.

Using a similar approach, Berman et al. (2017) study Africa at the cell level corresponding to a spatial resolution of 0.5 x 0.5 degrees latitude and longitude and covering the period 1997 to 2010. Using data from the ACLED, they find evidence that mineral price shifts trigger low-level as well as organised conflict incidents in Africa. Note that ACLED offers data since 1997 which truncates the sample. In contrast we are able to use a much larger sample of georeferenced data covering the period 1950 to 2008. Nevertheless, we also use the ACLED dataset to check robustness of our results. We are able to exploit giant and major resource (oilfield and minerals) discovery as exogenous news shocks to identify the effects of natural resources on conflict whereas Berman et al. (2017) rely on the value of deposits. Note that, deposit value calculation is heavily reliant on certain assumptions on the discount rate, the country specific risk premium, the average gestation lag between production and discovery, and the average commodity price. Most of these factors are unlikely to be exogenous. Furthermore, the value of deposits are also likely to be correlated

⁶Hegre and Sambanis (2006) and Sambanis (2004) find that the effect of resource dependence on conflict onset is not robust. More recently, Bazzi and Blattman (2014) revisit the question and find no robust relationship between commodity price shocks and civil war.

with exploration effort. International commodity price could be influenced by an internationalised local conflict. Internationalised local conflicts could influence global geopolitics and the demand for ‘commodity futures contracts’ in the financial markets which in turn would influence commodity price. Eliminating top producers from the sample as is typically done by these studies may not satisfactorily address these challenges. The difference between ours and Berman et al.’s (2017) results perhaps could be explained by the heterogeneous effects of discovery and production on conflict as the prospect of future production affects conflict onset and incidence less than actual production (Humphreys, 2005). Nevertheless, we also estimate a model by interacting discoveries with post discovery commodity price as a measure of expected discovery value a specification nearest to Berman et al. (2017). This result is reported in section 5.6.

The remainder of the paper is structured as follows: Section 2 discusses the related literature on the causal links between natural resource discovery and conflict. Section 3, describes the data and descriptive statistics. Section 4 discusses the empirical strategy to identify the effects of natural resource discovery shocks. Section 5 presents evidence and discusses the causal mechanism. This section examines the effect of discovery on conflict onset, incidence, and intensity separately. It also reports any potential heterogeneous effect across resource types (oilfield and minerals), proximity to discovery and national border, size of discovery (giant and major), and quality of political institutions. Section 6 deals with robustness and section 7 concludes.

2 Why Resource Discovery Might Cause Armed Conflict?

The causal effect of natural resource discoveries on the risk and intensity of intra-state armed conflict could be ambiguous (Besley and Persson, 2011). There is a wide range of plausible rival mechanisms of the resource-conflict association (Humphreys, 2005). Here we highlight a set of mechanisms that could be behind a potential (positive or negative) association between natural resource discovery and intra-state armed conflict.

The Opportunity Cost Mechanism: The opportunity cost mechanism treats conflict as an economically important activity. This logic originates from the economic analysis of crime literature (Becker, 1968). The hypothesis states that if the returns from conventional economic activities such as farming or wage labour are too low then that motivates civilians to rebel thereby increasing the likelihood of an armed conflict (Collier and Hoeffler, 1998, 2004; Miguel et al., 2004). In the event of natural resource discovery both income expectations and actual income could rise thereby reducing the likelihood of armed conflict. Alternatively, resource extraction could negatively affect the wages of low skilled low income households as it is predominantly capital intensive thereby increasing the likelihood of conflict (Dal Bo and Dal Bo, 2011). Dube and Vargas (2013) find support for the latter mechanism using Colombian data where positive resource price shocks tend to increase conflict.

The State as a Prize Mechanism: Discovering natural resources may increase the prize value of state capture and in turn increase the incentive for an armed conflict (Fearon, 2005). There are two prominent variants of this argument. The first focuses on the local rebels engaging in direct armed conflict against the state to benefit from resource discoveries (Collier and Hoeffler, 2004). The second focuses more on the role of geography as rebels groups in resource rich regions fight to secede from the state (Humphreys, 2005; Morelli and Rohner, 2015). Africa in particular has experienced several episodes of armed secessionist movements since independence and some studies observe that resource discoveries play a significant role (Fearon, 2005).

The Political Patronage Mechanism: The political patronage mechanism stipulates that natural resource discovery generates political incentives for incumbents to distribute political patronage more widely to survive longer in power (Andersen and Aslaksen, 2013; Cuaresma et al., 2010; Robinson et al., 2006). Distribution of patronage to the elites and citizens more widely ensures that the incumbent dissuades a militant subset of the society from attempting armed rebellion (Francois et al., 2015). Patronage distribution may take the form of public sector employment offers, ethnic brokerage, or personal networks that connect the co-opted elites in the centre to local citizens (Roessler, 2011). Patronage distribution could also influence the voting behaviour of citizens (Robinson et al., 2006). In summary, the political patronage mechanism predicts an inverse association between resource discovery and armed conflict.

The State Capacity Mechanism: The state capacity mechanism stipulates that resource discovery increases the state's counter insurgency capacity through endowing it with additional revenue thereby reducing the likelihood of conflict (Bell and Wolford, 2014; Besley and Persson, 2009). Cotet and Tsui (2013a) and Bazzi and Blattman (2014) find evidence in support of this mechanism.

The Credit Constraint Mechanism: Natural resource discovery could relax credit constraint for a rebel group making rebellion feasible and easier to sustain. Fearon (2004) and Collier et al. (2009) find support in favour of this mechanism.

The Grievance Mechanism: Resource discovery and subsequent extraction could exacerbate grievances from environmental degradation, or limited access to lucrative mining jobs. This could culminate into armed conflict (Humphreys, 2005).

3 Data

Our main objective is to study the effect of natural resource discovery shocks on the risk and intensity of intra-state armed conflict in Africa at the subnational grid-cell level. Therefore, we divide the whole continent of Africa into a spatial resolution of 0.5 x 0.5 degrees latitude and longitude, which approximately amounts to 55 x 55 square kilometres at the equator. In order to check robustness of our results, we also analyse the relationship at higher levels of aggregation with a spatial resolution of 1 x 1 degrees latitude and longitude. These results are discussed in section 5.5. We have data on the specific geographic location of armed conflict events, mineral and oilfield discoveries, and local economic activities measured by nighttime lights. Our level of geographical aggregation is well matched with the standardized PRIO-GRID project (Tollefsen et al., 2012), which allows us to merge our natural resource discovery dataset with the conflict dataset. Appendix A1 presents a list of countries, table 1 reports summary statistics, and Appendix A2 presents detailed definition of variables.⁷ Figure 1 presents the grid-cell level boundary map of Africa. In what follows is a brief discussion of the data.

3.1 Natural Resource Discovery Data

We use two datasets containing the geographical location of natural resource discoveries in Africa: MinEx mineral deposits (MinEx Consulting, 2013) and Mike Horn (2011) giant oilfield discovery.⁸ MinEx reports 263 discoveries of 19 minerals over the period 1950 to

⁷We also check for stationarity of the variables used in the model using Levin-Lin-Chu and Harris-Tzavalis variety of unit root tests. Both tests account for bias emanating from cross-sectional association. We find all variables to be stationary.

⁸ Mike Horn identifies whether the field contains oil and/or gas. In the rest of the paper we refer to oil

2012.⁹ They also report the size of the discoveries: major and giant. MinEx codes a mineral deposit as giant if it has the capacity to generate at least USD 0.5 billion of annual revenue for 20 years or more accounting for fluctuations in commodity prices. A major mineral deposit is defined as one that could generate an annual revenue stream of at least USD 50 million but not as long life as a giant reserve. Mike Horn (2011) reports 59 onshore giant oilfield (including condensate) discoveries in Africa over the period 1955 to 2010. Mike Horn codes oilfield as giant if it has ultimate recoverable reserves (URR) of at least 500 million barrels of oil equivalent. This is equivalent to an annual revenue stream of approximately USD 0.4 billion under the assumptions that over the sample period the average gestation lag between production and discovery is 5 years, the average price of a barrel is USD 25, and the average discount rate including the country specific risk premium is 10 percent.¹⁰ Therefore, it is reasonable to assume that both the giant oil and mineral discovery shocks are approximately of the same size on average. However, it is important to note that the value of discoveries are estimates and the projections are reliant on the estimation of the value at the time of the discovery. These estimates are often revised in subsequent years. The ultimately recoverable deposit could also change if there is a major shift in technology. Therefore, discoveries are better treated as exogenous news shocks rather than projection based expected revenue shocks.

Based on this information from both datasets, we construct an indicator whether a grid has discovered at least one giant or major natural resource (oil and/or minerals) deposit in a given year. We also presents separate estimates for oil and mineral discoveries. Figure 2 presents a map of oilfield and mineral discovery locations.

We observe that countries are heterogeneous in terms of the number of discoveries. For example, Botswana, Burkina Faso, DRC, Ghana, Mali, Namibia, South Africa, Tanzania and Zimbabwe individually represent more than 4% of the total mineral discoveries in the continent while other countries feature a lot less on the mineral discovery league table. In the oilfield discovery dataset, Libya and Nigeria accounts for 45.8% and 23.7% of the total African oilfield discoveries respectively. We also observe that 47.9% of the mineral discoveries are gold whereas 78% of the hydrocarbon discoveries are oil.¹¹

3.2 Conflict Data

We use three geocoded datasets of conflict events in Africa: the PRIO-GRID conflict dataset, the Armed Conflict Location and Event Dataset (ACLED) and the Uppsala Conflict Data Program Georeferenced Event Dataset (UCDP GED). These datasets cover different time periods. The PRIO-GRID (Version 1.01) presents a long time series, 1946-2008 while the ACLED and the UCDP GED (Version 1.5) covers the time period 1997-2012 and 1989-2010 respectively. The conflict events recorded in these datasets are obtained from various sources including press reports, books, historical archives, and databases.

The temporal PRIO-GRID is a vector grid-cell network with 0.5 x 0.5 degrees. It contains cell-specific information on the onset and incidence of armed conflict, represented by a conflict ID variable that corresponds to the standard UCDP or PRIO datasets (Tollefsen et al., 2012).

and/or gas as oilfield discoveries.

⁹ See footnote 3 for a list.

¹⁰ Some studies claim that the risk premium augmented discount rate should be as high as 14-15 percent. Arezki et al. (2017) presents a more sophisticated analysis of net present value of giant oil discoveries and find that the median size of a giant discovery is approximately 5-6 percent of GDP.

¹¹ These results are reported in long appendix tables A.1 – A.3.

Studies show that historical conflict systematically predicts contemporary conflict in post-colonial Africa (Besley and Reynal-Querol, 2014). Hence, historical legacy of conflict within a grid-cell could contaminate the potential causal relationship between resource discovery and conflict. Indeed causality could run in the opposite direction as mining companies could avoid exploration in locations with a history of conflict. For this reason, we are only interested in the conflict onset variable from the conflict attribute table in PRIO-GRID. The PRIO-GRID conflict onset is a dummy variable identifying the grid-cells hosting the initial battle location for each new intrastate armed conflict. Note that by definition these cells host the start of a new conflict and therefore they never had a conflict before. It takes the value 1 for the first year of an outbreak with 25 or more fatalities and 0 for all other years. According to UCDP and PRIO, an armed conflict is defined as 'a contested incompatibility between a government and one or more opposition groups that result in at least 25 battle deaths in a year' (Gleditsch et al., 2002).

We also use alternative definitions of armed conflict onset using ACLED and UCDP GED. ACLED codes violent political activity within all African states, including dyadic interactions between rebels and governments, riots and protests within and outside a civil conflict, and violence perpetrated against civilians (Raleigh et al., 2010). However, it does not specify a battle related fatalities threshold and conflict events may not adhere to the standard UCDP or PRIO definitions. Hence we focus on the ACLED's battle related armed conflict definition which was also used by others in the literature.¹² Note that ACLED defines a battle as 'a violent interaction between two politically organised armed groups at a particular time and location within the context of an armed conflict or civil conflict' (Raleigh et al., 2010).

The UCDP GED dataset codes conflict as 1 if the following two conditions are met: (a) at least one fatality; and (b) the relevant actors in the dyad have fought in a battle in which at least 25 died at any point in the series. Therefore, UCDP GED dataset contains armed conflict events for all actors that surpass the 25 deaths threshold per year at any point in the series (Sundberg and Melander, 2013). We use the Bazzi and Blattman (2014) conflict onset definition to code onset using the ACLED and UCDP GED datasets. This definition of onset is the most widely used in the cross-country literature. It codes onset as 1 when at least one conflict event takes place in a country-year that had no event in the prior year (rather than no conflict event ever). The stringent 'no conflict event ever' definition is applied to conflict onset coding using the PRIO-GRID dataset. All peace years are coded as 0 and the years of ongoing conflict are coded as missing.

All three conflict datasets report the precise geographical location of conflict. Hence we are able to merge the PRIO-GRID's armed conflict onset to our spatial-temporal grid-cell structure. For ACLED and UCDP GED, we aggregate the conflict event data by year and grid-cell. Our unit of analysis therefore is a cell-year. Figures 3-5 presents maps of armed conflict onset locations from the PRIO-GRID, ACLED, and UCDP GED datasets respectively.

The literature acknowledges that these conflict datasets could over-represent certain countries or conflict types and or sub-national regions (Berman and Couttenier, 2015). In particular, we observe the following three broad trends. First, the number of grid-cells with intra-state armed conflict varies across the three datasets. Second, conflict across countries within the African continent is heterogeneously distributed and this distribution varies across datasets. Third, the distribution of conflict affected grid-cells within a country also varies across datasets. We document these trends in the long Appendix.¹³ Note that these datasets

¹² In some studies ACLED's battle related armed conflict is referred to as organised violence. See for example Berman et al. (2017).

¹³ See Figures A.1, A.2 and Tables A.4-A.6 in the long appendix for details.

have been constructed under different rules and institutions. Therefore, any definitional or otherwise traits in them are likely to be idiosyncratic. Since we are finding consistent results across three different datasets, it is unlikely that these results are driven by measurement error or idiosyncrasies. Furthermore, our very demanding high dimensional fixed effects approach also make it unlikely that the results are driven by measurement error and data quality issues.

3.3 Night Lights Data as a Proxy for Local Economic Performance

We do not have measures of income for Africa at the grid-cell level. We use satellite data on night lights or luminosity density observed over the period 1992 to 2012 as our proxy for income. We acknowledge that using night lights as a proxy has limitations. However, this is the best that we could do in the absence of income data to match our spatially and temporally detailed conflict and resource discovery data. We calculate luminosity density by dividing the sum of all night lights pixel values within a grid by the grid area. We source the night lights data from the Defence Meteorological Satellite Program's Operational Linescan System (DMSP-OLS). The satellite images of the earth are captured between 20:30 to 22:00 local time, and the satellites circle the earth 14 times per day. The data we use here is the cleaned luminosity after filtering for cloud coverage, other ephemeral lights, and background noise. The measure comes on a scale from 0 to 63 (digital number) calculated for every 30-second area (equivalent to 1 square kilometre), where a higher value imply greater night lights intensity.

The distribution of night lights across grids is not normal. We have a significant volume of observations that takes the value zero. In order to account for this, we follow Michalopoulos and Papaioannou (2013) and Hodler and Raschky (2014) and define the dependent variable as the natural log of night lights density plus 0.01. It is widely acknowledged that such transformation ensures that all available observations are used and the problem of outliers minimised.

The other challenge with night lights data is measurement error. In particular, issues relating to the difference between true lights emanating into space and what is recorded by a satellite (Henderson et al., 2012). There is also variation in recorded lights data across satellites. Measurement error of this nature is unlikely to be a concern here as it is orthogonal to our models presented in section 4.2. Furthermore, any cross-satellite variation in night lights is already accounted for by the year dummy variable capturing time-varying common shocks.¹⁴

3.4 Other Grid-Cell Specific Data

We construct grid-cell specific commodity price index variable following the approach of Brückner and Ciccone (2010) in the cross-country growth literature. We use the following formula.

$$CPI_{jt} = \sum_{i=1}^{20} \omega_{ij} P_{it}$$

where ω_{ij} is grid-cell j 's share of the commodity i in the grid-cell's total production of the commodity in 2000 (or in a year closest to 2000 in case 2000 data is unavailable) and P_{it} is the annual global price series of the commodity i . The mineral production data comes from

¹⁴ Note that there is time series variation in satellite data here as different satellites cover different years but there is no cross-section variation as all grids in our sample at a particular point in time are covered by the same satellite.

IntierraRMG and the oil production data comes from Cotet and Tsui (2013a). The production data is used to compute production shares of commodities. The price data is extracted from the IMF Commodity Prices, United States Geological Survey (USGS) historical commodity prices, and Bazzi and Blattman (2014). All prices are normalized to the initial sample period as the base year.

The robustness section includes measures of the distance between grid's centroid and the closest national border. We source this data from PRIO-GRID's distance attribute table. We also use regional GDP per capita, grid-cell specific total population, and ethnic political exclusion from executive state power. All of these variables are sourced from PRIO-GRID. Note that the PRIO-GRID itself relies on other datasets such as the geographically based economic data (G-Econ) for regional GDP (Nordhaus et al., 2006) and the Ethnic Power Relations (EPR) dataset for ethnic political variables (Wucherpfennig et al., 2011).

Our democracy variable is the Polity2 score. It is based on parameters such as executive constraints, competitiveness of political participation, and openness and competitiveness of executive recruitment (Marshall et al., 2014).

4 Empirical Strategy

4.1 Resource Discovery and Local Armed Conflict

We use a panel dataset covering more than 10000 grids from 48 African countries.¹⁵ The grids are constructed using ArcGIS. To analyse the local effects of resource discovery on conflict, we estimate the following model:

$$Conf_{g,t+j} = \alpha_g + \beta_t + \mu_{g,t} + \eta_{i,t} + \gamma_1 Discov_{g,t} + \gamma_2 Past Discov_{g,t} + \varepsilon_{g,t} \quad (1)$$

where $Conf_{g,t+j}$ is the outcome variable that captures conflict onset, conflict incidence, and conflict intensity in cell g at year t . The variable $Discov_{g,t}$ is an indicator of resource discovery in cell g at year t . $Past Discov_{g,t}$ is the number of years with resource discoveries in the last ten years (from $t - 10$ to $t - 1$). Note that $Past Discov_{g,t}$ accounts for the history of discovery news shock in that cell. It is coded to take the value $N \in \{1(1)10\}$ for a particular cell-year if that grid-cell had N discovery years over the past 10 years. The 10 year window is based on Lei and Michaels (2014). Our results are not sensitive to the inclusion or exclusion of past discoveries and or alternative definitions of past discoveries. We estimate this model for different leads j , where in most cases $j \in \{0, 2, 4, 6, 8, 10\}$.

As discussed earlier, our main dependent variable is armed conflict onset from PRIO-GRID. It is a rare event with 84 instances of battles with more than 25 fatalities. This definition of conflict onset could be viewed as overly restrictive even though it does very well in addressing endogeneity issues. Therefore we also use the Bazzi and Blattman (2014) definition of conflict onset for ACLED and UCDP GED datasets. There are 3473 conflict onset events in ACLED, and 3272 onset events in UCDP GED.

We also estimate the effect of resource discovery on conflict incidence, conflict intensity and conflict ending. Conflict incidence is a dummy variable which takes the value 1 for cell-years when there is an intrastate armed conflict with more than 25 fatalities. Conflict

¹⁵ Due to data limitations, our sample period varies from specification to specification depending on the conflict dataset: PRIO-GRID (1950-2008), ACLED (1997-2012) and UCDP GED (1989-2010). In most specifications, the panel is unbalanced. Appendix A1 presents a list of countries included in the sample.

intensity is measured by the number of conflict events observed in a cell-year. Conflict ending codes all years of ongoing conflict as 0 and the year of ending as 1 using UCDP-GED and ACLED datasets (Bazzi and Blattman, 2014). Even though widely used in some circles, conflict incidence and intensity measures are criticised because of the lack of uniformity in their definitions (Sambanis, 2004). Fearon (2011) and Ciccone (2011) argue that both conflict incidence and intensity are aggregate measures of onset and persistence. Conflict onset and its continuation are disparate outcome variables potentially driven by widely different factors. Hence, there is very little logic in combining the two and assuming that resource discovery would affect them in the same way. Following some notable recent studies (Ciccone, 2011; Cotet and Tsui, 2013a) we use the terms 'armed conflict' and 'civil conflict' interchangeably.

Our main coefficient of interest here is γ_1 which presents the effect of resource discovery on conflict. If African conflicts are natural resource driven then we would expect γ_1 to be positive and statistically significant. Any indication otherwise would serve as a refutation of the view that resource discovery triggers conflict in Africa.

In all specifications, we control for high dimension fixed effects: grid-cell fixed effects α_g , year dummies β_t , grid-cell specific time trend $\mu_{g,t}$ and countrywide time-varying characteristics $\eta_{i,t}$. Grid-cell fixed effects account for geological characteristics, altitude and ruggedness, proximity to the ports and cities, and ethnic characteristics. It also captures potential time invariant systematic differences across cells affecting conflict data recording and reporting. Year fixed effects account for global shocks such as a spike in minerals or oil price. Grid-cell specific time trend accounts for external shocks such as a cell specific weather event. The country x year fixed effects account for factors such as property rights protection, exploration effort, defence burden or military expenditure as a share of GDP, national political dynamics including elections, and national regulations regarding resource exploration and other institutions.

Our identification strategy is a treatment-control procedure that uses the discovery news shock as the treatment and compares it to cells with no discoveries. It relies on the assumptions that the effect of the discovery news shock differs with discovery status, and the evolution of armed conflict is otherwise common in all cells.

In all estimations, we use robust standard errors clustered at the country level. We also use the Driscoll-Kraay standard errors (Driscoll and Kraay, 1998) which is derived from a non-parametric heteroscedasticity and autocorrelation consistent estimator of the variance-covariance matrix.¹⁶ In addition we check the robustness of our results using default standard errors, standard errors clustered at different spatial levels including cells and regions, and standard errors that allow for both cross-sectional spatial correlation and grid-specific serial correlation (or Conley standard errors) (Conley, 1999; Conley and Molinari, 2007).

Is the discovery news shock an appropriate identifier here? First, major and giant discovery news shocks signal significant increases in future economic rent and therefore suitably captures the economic motivation of a conflict. Second, in all likelihood the timing of a giant or major natural resource discovery is exogenous because of its unexpected nature. However, natural resource discoveries in the recent past could raise the likelihood of additional discoveries in the immediate future. This does not appear to be the case within a cell. In table 2 we find a positive correlation between past and future discoveries in pooled OLS models (see columns 1, 3, and 5), but the correlation reverses within a cell when we control for high dimension fixed effects (see columns 2, 4, and 6). This is not surprising

¹⁶ The Driscoll-Kraay standard errors are an extension of the common non-parametric variance-covariance matrix estimation techniques robust to the very general forms of spatial and temporal dependence (Cameron and Miller, 2015; Hoechle, 2007).

given that a cell is much smaller than a region or a country.¹⁷ In Table 3 we further check exogeneity of resource discovery by correlating it with past economic and political factors (Lei and Michaels, 2014). We observe that a cell's average economic performance, political institutions, and conflict intensity over the preceding years is not a robust predictor of resource discovery. They also appear to be jointly insignificant with a p-value = 0.4 (see column 7, table 3). This is suggestive that giant and major resource discoveries are indeed orthogonal. Figure 6 also supports the exogeneity view as we notice that the timing of discovery is not tracked by commodity price and African GDP per capita. Third, discovery date signifies a clear start of the experiment which allows us to track the intertemporal effects of discovery, construction, and production. Therefore, we are able to distinguish between expectation induced and actual revenue induced effects.

Exploration effort which leads to successful discoveries could be influenced by pre-existing conflict and property rights institutions. Note that there are no grid-cell level exploration expenditure or effort data. Hence, we use political exclusion of a grid-specific ethnic group from state power as a measure of grid-cell level property rights institutions. Section 5.1 presents more discussion on this.

4.2 Causal Mechanisms

What is the mechanism through which resource discovery affects conflict? The literature offers several explanations some of which we have reviewed in section 2. Our data allows us to test the income and patronage mechanisms. The former postulates that resource discovery and extraction increases citizens' income and general wellbeing thereby reducing the likelihood of conflict. The latter postulates that resource discovery provides additional resources to incumbents which then they could use for patronage distribution. Patronage distribution reduces the likelihood of conflict.

First, we estimate the following specification to test the link between resource discovery and local income measured by night lights. If resource discovery improves local income then we would expect θ_1 to be positive and significant.

$$Luminosity_{g,t+j} = \alpha_g + \beta_t + \mu_{g,t} + \eta_{i,t} + \theta_1 Discov_{g,t} + \theta_2 Past Discov_{g,t} + \varsigma_{g,t} \quad (2)$$

Second, using the following model we test the link between this improved income and armed conflict onset.

$$Conf_{g,t+j} = \alpha_g + \beta_t + \mu_{g,t} + \eta_{i,t} + \lambda_1 Discov_{g,t} + \lambda_2 Luminosity_{g,t+j} + \lambda_3 Past Discov_{g,t} + \xi_{g,t} \quad (3)$$

If resource discovery affects conflict exclusively via the income channel then we would expect λ_2 to be significant and λ_1 to be insignificant. For λ_2 to be a causal estimate the following identifying assumptions need to be satisfied. The composite error term in equation (3) after incorporating the predicted values of equation (2) should have zero mean and should be uncorrelated with all the explanatory variables. Even though there is no direct way of testing these assumptions, the presence of the high dimension fixed effects make it likely that these assumptions are satisfied. However, we cannot be certain that this is indeed the case. At the very least this strategy offers correlation that is informative.

Luminosity data has been used widely as a proxy for local economic development

¹⁷ Region and country level results are reported in the long appendix (Tables A.7 - A.8). The country level result is consistent with Lei and Michaels (2014).

which we use here (Henderson et al., 2012; Hodler and Raschky, 2014; Michalopoulos and Papaioannou, 2013, Mamo et al., 2019).¹⁸

5 Evidence

5.1 Resource Discovery and Conflict: Onset, Incidence, Intensity and Ending

In this section we report the main empirical results. In tables 4 and 5 we investigate the association between resource discovery and the PRIO-GRID conflict onset variable. Table 4 reports the standard pooled OLS regressions. The estimate of γ_1 is negative and significant indicating that resource discovery reduces the probability of conflict onset in a between-cell time-series setting. The size of the effect is small: a point estimate of 0.0001. The negative effect appears to be stable across resource type (see Panels B and C). It is also persistent over time as it survives 10 years after discovery.

In table 5 we focus on within cell effects by controlling for high dimension fixed effects. The estimate of γ_1 is negative and insignificant. To what extent the negative correlation between past conflict intensity and discovery could drive these effects. If we are to assume the insignificant coefficient of -0.00031 in table 3 column 6 to be significant then its lower bound from the 95% confidence interval would be -0.000898. If we suppose that the degree of correlation between past conflict and discovery is given by this lower bound -0.000898 then it would increase the conflict onset probability within a cell by 0.000003. As is apparent, this would not be enough to reduce any of the reported coefficients in table 5, panel A, columns 1-6 to zero.

Note that, the individual effects of oilfield and mineral discoveries within a cell remain negative but insignificant (see Panels B and C). Figure 7 displays a non-parametric local polynomial regression of resource discovery on conflict onset conditioned on the high dimension fixed effects. Even though not always statistically significant, the figure demonstrate a decline in the likelihood of conflict onset post discovery. Oilfield and mineral discoveries follow a very similar trajectory.

We address identification challenges by introducing resource discovery news shocks. An alternative argument could be that these shocks are not random as they are dependent on exploration effort and property rights protection. In table 6 we estimate the same model as in table 5 but after controlling for property rights institutions at the grid-cell level. It is difficult to find direct measures of property rights at the grid-cell level. We use political exclusion of the dominant ethnic group in a particular grid-cell from the state executive as a proxy measure of property rights institutions. The key assumption here is that political exclusion would lead to higher expropriation risk for private and state property. This measure is sourced from PRIO-GRID or Tollefsen et al. (2012). Note that the sample size reduces significantly due to missing data for the political exclusion variable. The result hardly changes from table 5. In fact, the negative coefficients on oil discovery in panel B now becomes statistically significant.

Nevertheless, we also perform two additional checks with the data that we have. We test the effects of ‘first discovery’ shocks and ‘single first discovery’ shocks. The former are cells which did not have a discovery before and the latter are cells which had only one discovery over the sample period. Note that we distinguish between ‘minerals + oilfield’, ‘minerals’, and ‘oilfield’. ‘Minerals’ include major and giant discoveries whereas ‘oilfield’

¹⁸ Night lights data could be reflecting changing population density. We therefore control for changing population density and our result remains robust. We also find no evidence of population surge following a resource discovery at the grid level. This result is independent of grid size (1 x 1 degree) or higher levels of aggregation (region level). See section 5.5.

covers giant discoveries only. These are rare events. In particular, ‘single first giant oilfield or mineral discoveries’ are extremely rare. Therefore it is reasonable to expect that they are orthogonal to the quality of property rights institutions at the cell level. In both cases we do not find any effect on conflict onset using all three datasets. These results are reported in table 7.¹⁹

In tables 8 and 9 we use conflict onset from the UCDP GED and ACLED datasets respectively and find that the negative and insignificant result is not unique to PRIO-GRID. This is reassuring and we can be reasonably confident that our result of ‘no conflict resource curse’ in Africa is not noisy.

Factors triggering a conflict could be different from factors motivating the continuation of a conflict. Therefore, we also analyse the effect of discovery on conflict incidence and intensity using data from UCDP GED and ACLED. However, incidence and intensity are not as clean measure of conflict as onset. This is because onset flags the start of a conflict whereas incidence and intensity are aggregate measures of both start and persistence. This confounds causality issues as pre-existing conflict could influence the unobservable exploration effort prior to the actual resource discovery. Nevertheless, we estimate these models and find that the negative and insignificant result remains unaltered.²⁰

Coding ‘conflict offset’ or ‘conflict ending’ separately similar to Bazzi and Blattman (2014) arguably offer a better test of conflict persistence than conflict incidence (which is a combination of onset and persistence). If we code ‘conflict ending’ separately then we do not find any effect of resource discovery as all coefficients are statistically insignificant.

5.2 Testing the Mechanisms

Theory predicts that natural resources could affect conflict through multiple channels. It is however difficult to establish these causal channels empirically. It is even more difficult for Africa due to the lack of data. Using satellite data on night lights (Henderson et al., 2012), we are at least able to indirectly test the income channel. Resource discovery could impact on the local living standards and influence the likelihood of a conflict.

We use natural logarithm of night lights density as a proxy for local living standards. This however restricts our sample to 1992 to 2012. In table 10, we find that resource discovery improves lights density after controlling for past discoveries and high dimension fixed effects. The early positive effect of the news shock is perhaps expectation induced. Discovery news shock could typically increase expectations of future economic activity which could induce demand driven expansion of the local economy. However, the expansion becomes stronger and strongly significant 4-6 years after discovery when construction and production starts. The effect remains strong 10 years after the discovery indicating strong positive effect of resource revenue during the production stage. This result is consistent with the findings of (Mamo et al., 2019)²¹ and Cotet and Tsui (2013b). The latter finds oil discoveries improve economic and health outcomes using cross-country data.

¹⁹ Long appendix tables A9 and A10 report first and single first discovery results with ACLED and UCDP-GED datasets. Specifications reported in table 7 is of the type

$$conflict_{jct} = \alpha_j + \beta_t + \mu_{jt} + \eta_{ct} + \sum_{i=0}^{10} \gamma_i RD_{j,t-i} + \varepsilon_{jct} \text{ where } RD_{j,t-i} \text{ is a dummy variable equal to 1 if a discovery}$$

has been made in the year $t-i$ in a particular grid-cell and 0 if no discovery has been made and missing for all years beyond 10 years after discovery.

²⁰ These results are reported in the long appendix (tables A.11-A.14).

²¹ The effect of resource discoveries on night lights could be driven by the lights emanating from the extractive industries themselves. Therefore, we ignore all lights around an arbitrary 2-5 kilometre radius of an oilfield or mine. Results reported in the long appendix remain unchanged.

In table 11 we explore whether the resource discovery driven improvement in living standards has any impact on conflict onset.²² In columns 1-6 we find that indeed higher local living standards (measured by night lights) reduce conflict onset after controlling for population density, past discovery and high dimensional fixed effects. We test whether the effect of resource discovery works exclusively through improvements in local living standards. The coefficient on resource discovery is consistently negative and significant in few cases which suggests that there is a direct effect of discovery on conflict over and above the indirect effect via the income channel. The direct effect could be reflective of the changes in expectations. The local population could expect higher future income after a discovery and this could reduce conflict. Our evidence appears to be qualitatively consistent with Bazzi and Blattman (2014) and Berman and Couttenier (2015).

To what extent the negative and insignificant effect of resource discovery on conflict works via the political patronage and or the military expenditure mechanisms in Africa? It is worthwhile noting that military expenditure represents state capacity towards repression and counterinsurgency. Alternatively, it could also represent a government response to escalating civil unrest. Figure 8(a) plots the nonparametric relationship between resource discovery and the number of cabinet posts. There is a positive relationship perhaps suggesting an increase in political patronage and hence a decline in conflict via the patronage mechanism.²³ However, our data does not appear to be supportive of the state capacity mechanism as in figure 8(b) we observe military expenditure as a share of GDP to moderately decline with discoveries. This is contrary to the cross-country results of Cotet and Tsui (2013a) where they report oil wealth increases defence burden as the state faces more violent challenges. Regressions corresponding to figure 8 is reported in table 12.

5.3 Heterogeneous Effects of Discovery Size and Distance

Giant discoveries are significantly larger than major discoveries. Therefore they should have a bigger effect on conflict due to their superior economic value. Furthermore, they also enter production more quickly.²⁴ Note that 64 percent of all mineral discoveries in our dataset are major while all the oil discoveries are giant. In table 13 we find that the negative and insignificant result is not affected by the size of discovery.

Another potential heterogeneity could arise from the proximity of a conflict to a discovered oilfield or a mine. One would expect armed conflicts to occur in faraway locations rather than in close proximity to a discovery. We calculate the time-varying distance to the nearest oilfield or mineral discoveries from the centroid of each grid (expressed in kilometres) and regress it on conflict onset after controlling for high dimension fixed effects. Distance does not seem to influence the negative and insignificant relationship between discovery and conflict onset irrespective of the dataset (PRIO-GRID, UCDP GED, or ACLED) used to define onset.

Finally, proximity to the border could also be a factor (Caselli et al., 2017). If resource discoveries are close to the border and two countries happen to have border disputes then we could very well be picking up the impact of the latter rather than the former. Border disputes between two countries often diffuse and morph into civil wars. Caselli et al. (2017) reports that the presence of natural resource endowments on the border are significant

²² Note that we are using UCDP GED conflict events here as the sample period matches more with night lights data. Results are similar with PRIO-GRID.

²³ This is consistent with the theoretical predictions of Robinson et al. (2006) and empirical evidence of Roessler (2011).

²⁴ Figure A.3 in the long appendix presents Kaplan Meier probability estimates for giant and major deposits entering production which attests to this point.

predictors of inter-state conflict. Therefore, we calculate the distance to national borders and divide the sample of grid-cells into 4 groups according to their distance to the border: less than 25 km, between 25-50 km, between 50-100 km, and greater than 100 km. We estimate equation 1 for each of these samples and three different datasets and the negative and insignificant result survives suggesting that proximity to the border (or conflict propensity) is not a factor here.²⁵

5.4 The Effects of Institutions

To what extent institutional quality influence the relationship between natural resources and conflict (Arezki and Gylfason, 2013)? Representative political institutions could increase legitimacy of the incumbent government and diffuse tensions. Therefore, one would expect democratic institutions to reduce negative consequences of natural resources on conflict. Alternatively, resource discoveries could reduce conflict in autocracies as they invest more into repression (Cotet and Tsui, 2013a). We test the link in table 14 using Polity 2 as a measure of institutional quality. We do not find any effect of institutions on the relationship between mineral discovery and conflict onset (Panel C). However, we find that oilfield discoveries lead to less intra-state conflict onset and that the negative effect is magnified in countries with good institutions.

5.5 Higher Levels of Aggregation: Grid Cells, Regions and Countries

Resource discovery in one cell could trigger conflict elsewhere in the neighbouring cell, region or country. Therefore, a grid-cell level analysis may not be fully informative here. Hence, we estimate the model using higher grid-cell resolution, region-year and country-year as units of analysis. Although determining the optimal level of aggregation is not straightforward, our aggregation procedure is twofold: systematic grouping (region and country level) and random grouping (higher level grid-cell demarcation).²⁶

We undertake the following three steps. First, we aggregate the conflict events and resource discoveries at higher grids-cells (1x1 degrees latitude and longitude, which is equivalent to 111x111 square kilometres at the equator) and estimate the main model. The effect of discovery on conflict onset remains statistically insignificant and negative in most cases.²⁷ Second, in table 15 we report the region level results. We find resource discovery significantly reduces conflict onset after controlling for year fixed effects, region fixed effects, region-specific time trend and country x year fixed effects. Third, in table 16 we estimate the relationship at the country level.²⁸ This result is comparable to recent cross-country studies by Cotet and Tsui (2013a) and Lei and Michaels (2014). Unlike these studies which solely focus on the effects of oilfield discovery, we are able to consider both oil and minerals. We find that oil and mineral discoveries have no discernible effect on conflict onset at the national level after controlling for fixed effects and country specific trends. Estimating the model separately for oil and minerals do not alter our results. The country level results confirm the findings of Cotet and Tsui (2013a). It is worthwhile noting that we do not find any evidence of the ecological inference fallacy here.

²⁵ These results are reported in tables A.15-A.20 in the long appendix.

²⁶ It is worthwhile noting that a key limitation with higher level aggregation is the phenomenon known as ecological inference fallacy (Maystadt et al., 2013). The association between resource discoveries and armed conflict may differ in magnitude and signs across different levels of aggregation.

²⁷ These results are reported in long appendix tables A.21-A.23.

²⁸ Region and country level results with ACLED and UCDP-GED datasets are reported in Long Appendix tables A.24 - A.27.

5.6 The Value of Discovery and Conflict

Berman et al. (2017) show that the value of deposits positively affect conflict. They measure the value of deposits by interacting production volume of a deposit with commodity price. In table 17 we follow the Berman et al. (2017) specification closely and interact commodity price with a discovery dummy variable. The discovery dummy variable here takes the value zero before discovery and one after discovery. Therefore the interaction with commodity price could be interpreted as the fluctuation in the value of the discovery due to commodity price movements after discovery. Note that the commodity price variable is described in section 3.4 and the dependent variable is conflict onset. The negative and largely insignificant result remains unaffected across all three datasets (PRIO-GRID, UCDP-GED, ACLED).

6 Robustness and Sensitivity Analysis

We conduct a battery of robustness tests and sensitivity analysis. These results are reported in the long appendix tables A.28 to A. 43 to save space.

A contentious issue relates to pooling grid-cells with at least one resource discovery with others. Some argue that grid-cells with resource discoveries are fundamentally different from others in ways that cannot be measured or controlled for directly (Lei and Michaels, 2014). Therefore pooling all grid-cells would constitute a violation of the common trend assumption. This is less of a threat here given our high dimension fixed effects. Nevertheless, we restrict the sample to observations where at least one resource discovery was made during the sample period and the negative and largely insignificant result survives.

Similarly we restrict our sample to grid-cells with at least one conflict event during the sample period. Berman and Couttenier (2015) refer to such grid-cells as ‘high conflict risk’. In fact the negative effect of resource discovery becomes bigger and statistically significant.

Some resource discoveries may cross grid-cell boundaries and take up large geographies thereby influencing conflict location. Therefore, we employ buffer zone analysis. We do this by creating a bigger zone (with varying Euclidean distance) around the resource discovery geo-coordinates and estimate the model. The main results remain unaffected.

Finally, we employ both logit and Poisson estimators. The logit model estimates the effect of discoveries on conflict onset and incidence whereas the Poisson model estimates the effect on count data variable such as conflict intensity. We observe strong negative effect of resource discovery on conflict.

Note that there are obvious challenges with employing non-linear (e.g., logit and Poisson) estimators in models with high dimension fixed effects. These challenges could be theoretical as well as computational. The relevant likelihood functions here converge only with country x year fixed effects. Bazzi and Blattman (2014) also report similar issues with their logit estimator. With country x year fixed effects the model perhaps do not do as good as equation (1) in terms of identification. However, it is perhaps reasonable to assume that it controls for exploration effort as effort is likely to be country specific and time varying.

7 Conclusions

Africa is often viewed as a prime location for natural resource driven conflict. The volume of research on this topic is sizeable. Yet establishing causality remains a challenge. In this paper we are able to set up a natural experiment to study the effect of natural resources on conflict

at the grid-cell level covering the period 1950 to 2008. Note that cells here correspond to a spatial resolution of 0.5 x 0.5 degrees latitude and longitudes (approximately 55 x 55 square kilometres at the equator). Using giant and major resource discovery dates as an exogenous news shock we find no evidence that natural resources trigger conflict in Africa. In particular, resource discovery significantly reduce the likelihood of conflict onset within 10 years post resource discovery in a pooled cross-section model. The effect becomes insignificant once we control for high dimension fixed effects. This broad pattern in the data holds with both conflict incidence, intensity and ending as dependent variables.

We also explore the mechanism through which discovery could affect conflict. Resource discovery appears to influence conflict indirectly via improved local living standards and directly via improved expectations of high future income. We find support for another conflict reducing mechanism through the distribution of political patronage by the state. In particular, resource discovery appears to increase the number of cabinet ministerial positions thereby reducing the likelihood of conflict.

A common argument is that the relationship between natural resources and conflict is national rather than local. Therefore, cell level analysis may not be appropriate here. Hence, we also test the relationship at higher grid-cell resolution, and regional and national levels. Our main result remains unaffected. There is little or no heterogeneity in the relationship between resource discovery and conflict across resource type, size of discovery, distance to discovery, distance to the national border, and institutional quality.

Our study presents new evidence in a literature where a significant number of earlier studies reported a positive relationship between natural resources and conflict. The difference in results perhaps stems from the following factors. First, heterogeneity in the data generating process could be a factor. Resource (oil and minerals) discovery is different from some of the variables used in the earlier literature (for example, resource extraction, primary exports, resource rent, value of deposits, and oil discovery). Furthermore, the definition of conflict varies significantly across studies also demonstrating heterogeneity. Second, it could also be due to the heterogeneity in the data frequency and unit of assessment. Majority of the earlier studies used cross-country data.

In spite of her colonial and post-colonial history as a supplier of raw materials, a vast majority of African natural wealth remains untapped (Collier, 2010). These resources are expected to be exploited over the coming two to three decades amid increasing global demand for raw materials. The expected steady depletion of natural resources and the favourable global commodity prices presents Africa with an opportunity to harness this wealth for improving state capacity and living standards. Our research suggests that both of these factors could significantly contribute towards the reduction of civil conflict in Africa.

Appendix

A1. List of Countries

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Cote d'Ivoire, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic of Congo, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

A2. Data Appendix

PRIO-GRID Conflict Onset: A dummy variable identifying the grid-cell hosting the first recorded battle location for each intrastate armed conflict with > 25 battle deaths. *Source:* Tollefsen et al. (2012).

UCDP GED Conflict Onset: The first year of outbreak with 25 or more fatalities take the value 1, all peace years equal 0, and years of ongoing conflict are coded as missing. *Source:* Sundberg and Melander (2013).

UCDP GED Conflict Incidence: A dummy variable equals one if at least one intrastate armed conflict with > 25 battle deaths happened in the grid-year. *Source:* Sundberg and Melander (2013).

UCDP GED Conflict Intensity: The number of intrastate armed conflict events with > 25 battle deaths observed in the grid-year. *Source:* Sundberg and Melander (2013).

ACLED Conflict Onset: The first year of battle related conflict outbreak take the value 1, all peace years equal 0, and years of ongoing conflict are coded as missing. *Source:* Raleigh et al. (2010).

ACLED Conflict Incidence: A dummy variable equals one if at least one intrastate battle related armed conflict happened in the grid-year. *Source:* Raleigh et al. (2010).

ACLED Conflict Intensity: The number of intrastate battle related armed conflict events observed in the grid-year. *Source:* Raleigh et al. (2010).

Natural Resource Discovery: A dummy variable taking the value one for at least one discovery of natural resources (giant or major oil/ mineral reserves) in a grid-year. *Source:* MinEx Consulting (2013) and Mike Horn (2011).

Oilfield Discovery: A dummy variable taking the value one for at least one discovery of a giant oil reserve in a grid-year. See section 3 for the definition of giant oil reserve. *Source:* Mike Horn (2011).

Mineral Discovery: A dummy variable taking the value one for at least one discovery of a giant or major mineral reserve in a grid-year. See section 3 for the definition of giant and major mineral reserve and footnote 3 for a list of minerals included in the dataset. *Source:* MinEx Consulting (2013).

Past Discoveries: It is the history of discovery news shock in that grid, coded to take the value $N \in \{1(1)10\}$ for a particular grid-year if that grid had N discovery years over the past 10 years. *Source:* MinEx Consulting (2013) and Mike Horn (2011).

Democracy: Democracy measured by the Polity2 score, which is based on executive constraints, the competitiveness of political participation, and the openness and competitiveness of executive recruitment. *Source:* Marshall et al. (2014).

Distance to the Border: Distance (in kilometers) from the grid cell centroid to the border of the nearest neighbouring country, regardless of whether the nearest country is located across international waters. *Source:* Tollefsen et al. (2012).

Distance to the National Capital: Distance (in kilometers) from the grid cell centroid to the national capital. *Source:* Tollefsen et al. (2012).

Travel Time to the Nearest Urban Centre: Estimated cell-average travel time (in minutes) by land transportation from the cell to the nearest major city with more than 50,000 inhabitants. Travel time is time invariant. *Source:* Tollefsen et al. (2012).

Ethnic Level Characteristics: Contains information of the identity of spatially defined, politically relevant ethnic groups settled in the grid cell. The covariates include ethnic total population and their inclusion and exclusion from executive state power. It also include the regional per capita GDP from G-Econ dataset. *Source:* Tollefsen et al. (2012).

Grid-cell Level Commodity Price: See section 3.4 for details. *Source:* Authors calculation using multiple sources.

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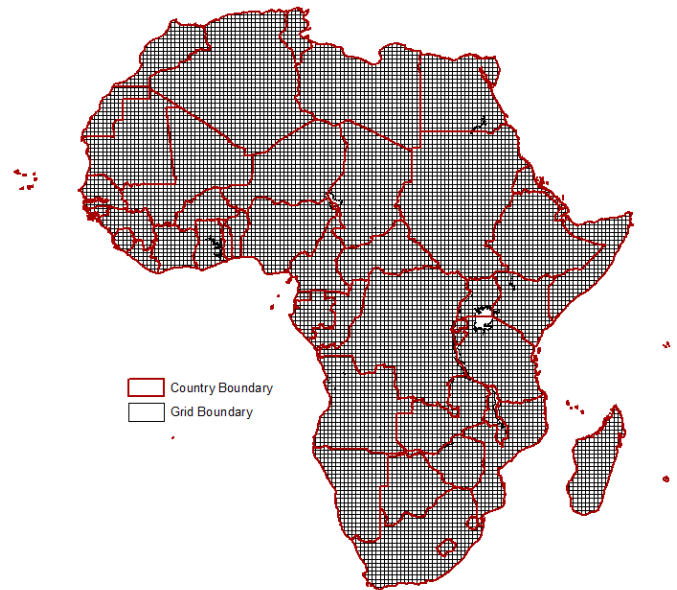
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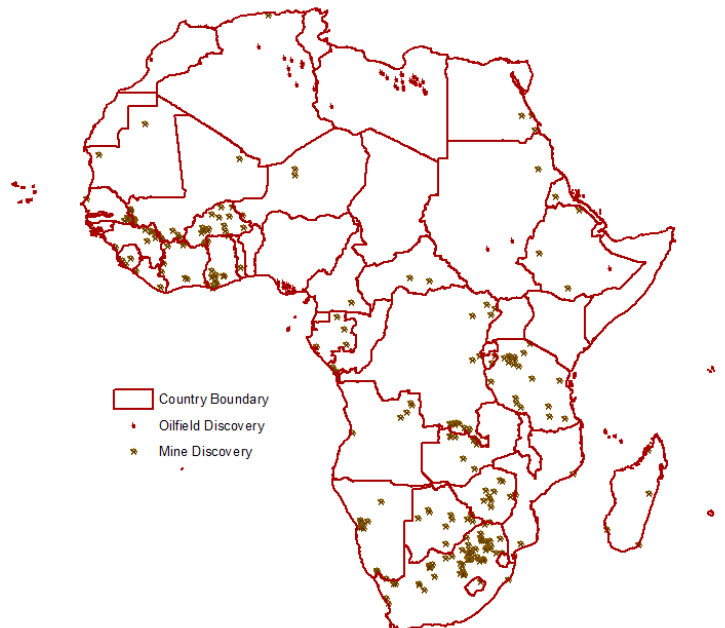
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Figure 1: Grid Cell Level Boundary Map of Africa



Notes: This boundary map is the grid-cell level subnational division of Africa. The cell has a spatial resolution of 0.5 x 0.5 degrees latitude and longitude (i.e. around 55 x 55 square kilometers at the equator).

Figure 2: Oilfield and Mineral Discovery Locations



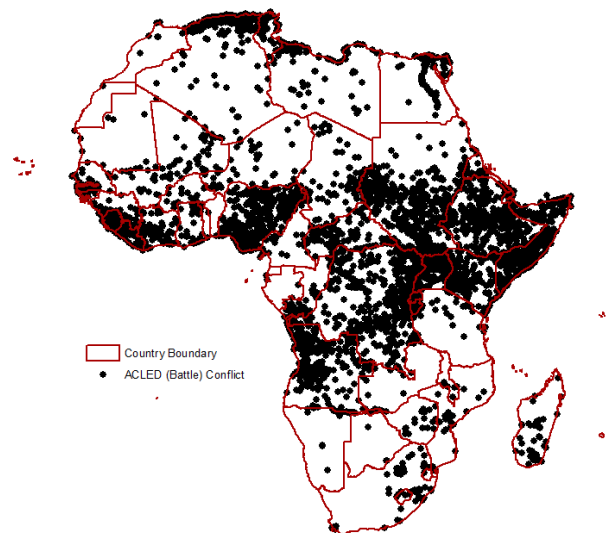
Notes: The map shows the location of mineral deposit and oilfield discoveries in Africa over the period 1950-2012.

Figure 3: PRIO-GRID Armed Conflict Onset Locations



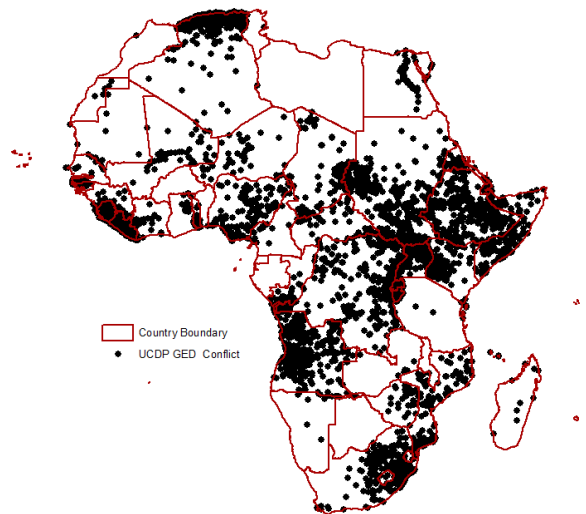
Notes: The map shows the location of PRIO-GRID armed conflict onset locations in Africa over the period 1946-2008.

Figure 4: ACLED Armed Conflict Locations



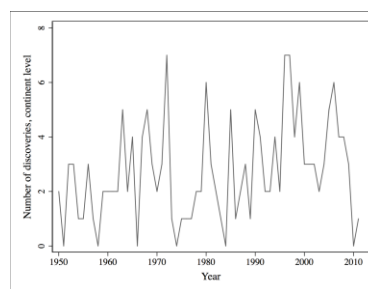
Notes: The map shows the location of ACLED battle related armed conflict locations in Africa over the period 1997-2012.

Figure 5: UCDP GED Armed Conflict Locations

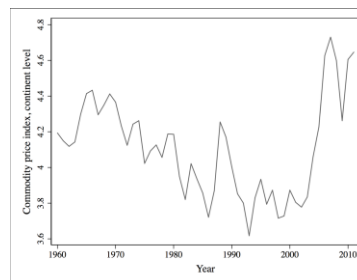


Notes: The map shows the location of UCDP GED armed conflict locations in Africa over the period 1989-2010.

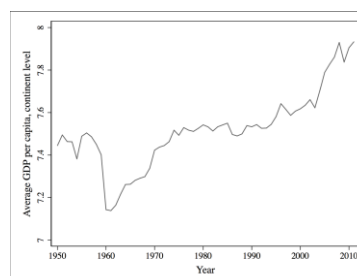
Figure 6: Discoveries, Commodity Price and GDP per capita in Africa over the period 1950-2010: Is There Co-movement?



A: Natural Resource Discovery



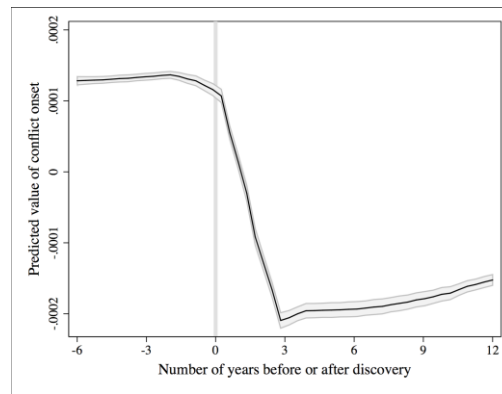
B: Commodity Price Index



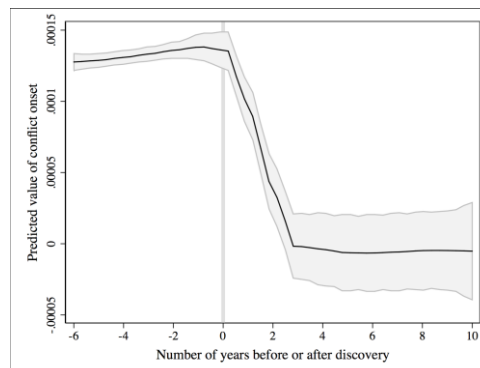
C: GDP Per Capita

Notes: The figures show the annual evolution of the number of discoveries, GDP per capita and international commodity price index in Africa over the period 1950-2010.

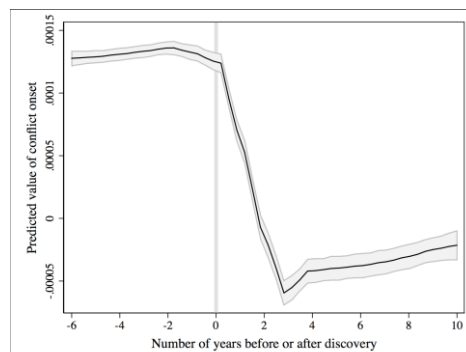
Figure 7: Resource Discovery and Conflict Onset: Predicted Values



A: Natural Resource: Oilfield and Minerals



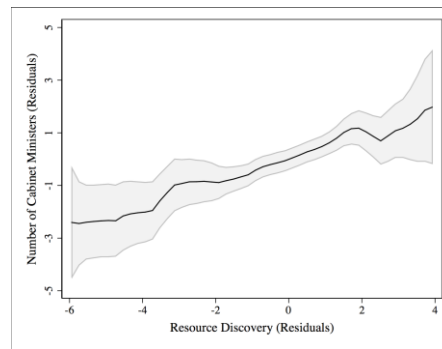
B: Oilfield Discovery



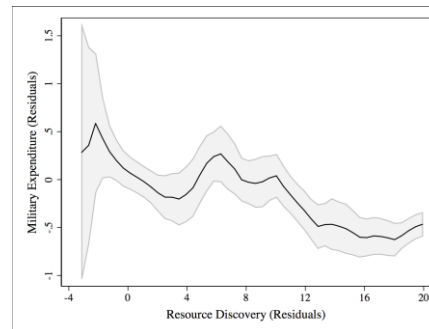
C: Mineral Discovery

Notes: These figures are plotted using the nonparametric local polynomial regression method with Epanechnikov kernel. The bar displays smoothed values with 95% confidence intervals. The nonparametric regression is conditional on past discovery, year fixed effects, grid-cell fixed effects, grid-cell specific time trends, and country x year fixed effects. We predict the value of conflict onset for a given discovery in a panel of cell-year observations. The sample period is 1950 - 2008.

Figure 8: Cabinet Size, Military Expenditure and Resource Discovery in Africa



(a) Cabinet Size and Resource Discovery



(b) Military Expenditure and Resource Discovery

Notes: The graph shows the association between government cabinet size (the number of cabinet positions), military expenditure and natural resource discovery. It uses nonparametric lpoly estimators of government cabinet size and military expenditure as functions of resource discoveries, pooled across all countries. These are country level analyses. Figures (a) and (b) are Kernel-weighted local polynomial smoothing and are free of parametric assumptions. ‘Number of Cabinet Ministers (Residuals)’ imply residual variation in the number of cabinet ministers after subtracting the country-specific arithmetic mean. ‘Military Expenditure (Residuals)’ imply residual variation in military expenditure after subtracting the country-specific arithmetic mean. Resource Discovery (Residuals) imply residual variation in the number of discoveries after subtracting country-specific arithmetic mean.

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	First Year	Last Year
Year Discovery of Oilfield and Mineral Resources					
Resource discovery indicator	646191	0.0004	0.0211	1950	2012
Years with res. disc. (t-10 to t-1)	646191	0.0038	0.0679	1950	2012
Oilfield discovery indicator	646191	0.0001	0.0089	1950	2012
Years with oil disc. (t-10 to t-1)	646191	0.0008	0.0311	1950	2012
Mineral discovery indicator	646191	0.0003	0.0192	1950	2012
Years with min. disc. (t-10 to t-1)	646191	0.0030	0.0604	1950	2012
PRIO-GRID Conflict Dataset					
Conflict on set indicator	646191	0.0001	0.0114	1946	2008
UCDP GED Conflict Dataset					
Conflict on set indicator	232208	0.014	0.118	1989	2010
Conflict incidence indicator	235246	0.027	0.161	1989	2010
Conflict intensity	235246	0.032	0.222	1989	2010
ACLED Conflict Dataset					
Conflict on set indicator	168499	0.021	0.142	1997	2012
Conflict incidence indicator	171088	0.035	0.185	1997	2012
Conflict intensity	171088	0.043	0.262	1997	2012
Democracy Variables					
Polity2	640395	-3.336	3.476	1950	2008
Resource discovery * Polity2	640395	-0.0005	0.105	1950	2008
Oilfield discovery * Polity2	640395	-0.0004	0.053	1950	2008
Mineral discovery * Polity2	640395	-0.0001	0.091	1950	2008
Additional Covariates: Grid Level Characteristics					
Area of the grid cell (sq. km)	646191	7.921	0.436	1946	2008
Distance to the border (km)	632646	4.679	1.137	1946	2008
Political Exclusion	284494	0.477	0.499	1946	2008

Notes: This table reports summary statistics for the main variables and other cell level additional covariates. See data appendix for variable descriptions and sources.

Table 2: Past Discoveries and Near Future Discoveries

Dependent Variable:	Natural Resource Discovery		Oilfield Discovery		Mineral Discovery	
	(1) Pooled OLS	(2) FE	(3) Pooled OLS	(4) FE	(5) Pooled OLS	(6) FE
Past Discovery	0.0144*** (0.003)	-0.0073*** (0.0021)	0.0111*** (0.005)	-0.0069*** (0.0014)	0.0154*** (0.003)	-0.0074*** (0.0026)
Year Fixed Effects	No	Yes	No	Yes	No	Yes
Cell Fixed Effects	No	Yes	No	Yes	No	Yes
Cell-Specific Time Trend	No	Yes	No	Yes	No	Yes
Country x Year Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	646191	646191	646191	646191	646191	646191
Sample Period	1950-2012	1950-2012	1950-2012	1950-2012	1950-2012	1950-2012

Notes: This table reports whether discoveries in a grid's recent past raise the odds of additional discoveries in its near future. The explanatory variable (past discovery) is the number of years with discoveries from t-10 to t-1. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 3: Is Natural Resource Discovery Random?

	Dependent Variable: Indicator of Natural Resource Discovery						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Per Capita GDP	-0.0003 (0.0002)						-0.0002 (0.0002)
Population Share		0.0014 (0.0014)					0.0014 (0.0023)
Population Size			0.0015 (0.0011)				0.0005 (0.0017)
Political Representation				-0.00014 (0.0005)			0.0015 (0.0010)
Political Exclusion					0.0005 (0.0003)		0.0017 (0.0013)
Past Conflict Intensity						-0.00031 (0.0003)	-0.00015 (0.0002)
Past Discovery	-0.0121*** (0.0031)	-0.0119*** (0.0030)	-0.0121*** (0.0031)	-0.0122*** (0.0031)	-0.0122*** (0.0031)	-0.01256*** (0.004)	-0.01289*** (0.004)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	249951	255754	250389	252889	252889	255,754	246,419
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports whether the timing of natural resource discoveries is correlated with the mean of cell's economic and political variables in the past years. Past discovery is the number of years with discoveries from t-10 to t-1. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively

Table 4: Resource Discovery and Civil Conflict Onset: Between-Cell Effects

	Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)					
	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.00011*** (0.000021)	-0.00012*** (0.000021)	-0.00012*** (0.000023)	-0.00013*** (0.000024)	-0.00013*** (0.000025)	-0.00014*** (0.000026)
Past Discovery	-0.00011*** (0.000021)	-0.00011*** (0.000021)	-0.00011*** (0.000022)	-0.00012*** (0.000023)	-0.00012*** (0.000023)	-0.00012*** (0.000024)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.00011*** (0.000021)	-0.00012*** (0.000022)	-0.00012*** (0.000023)	-0.00013*** (0.000023)	-0.00013*** (0.000024)	-0.00014*** (0.000025)
Past Discovery	-0.00011*** (0.000020)	-0.00011*** (0.000020)	-0.00011*** (0.000020)	-0.00011*** (0.000020)	-0.00012*** (0.000022)	-0.00012*** (0.000022)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.00011*** (0.000022)	-0.00012*** (0.000023)	-0.00012*** (0.000024)	-0.00013*** (0.000024)	-0.00013*** (0.000025)	-0.00014*** (0.000026)
Past Discovery	-0.00011*** (0.000021)	-0.00011*** (0.000022)	-0.00011*** (0.000023)	-0.00013*** (0.000024)	-0.00012*** (0.000024)	-0.00012*** (0.000025)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 5: Resource Discovery and Civil Conflict Onset: Within-Cell Effects

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.00032* (0.00018)	-0.00028 (0.00018)	-0.00031 (0.0019)	-0.00034 (0.00021)	-0.00037 (0.00023)	-0.00039 (0.00025)
Past Discovery	-0.00028* (0.00015)	-0.00031 (0.00019)	-0.00033 (0.00021)	-0.00036 (0.00023)	-0.00039 (0.00025)	-0.00041 (0.00027)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.00063 (0.00065)	-0.00066 (0.00068)	-0.00069 (0.00071)	-0.00074 (0.00075)	0.00078 (0.00079)	-0.00083 (0.00083)
Past Discovery	-0.00060 (0.00059)	-0.00063 (0.00062)	-0.00066 (0.00065)	-0.00071 (0.00069)	0.00076 (0.00074)	-0.00082 (0.00079)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.00025 (0.00017)	-0.00019 (0.00013)	-0.00022 (0.00014)	-0.00023 (0.00016)	-0.00025 (0.00018)	-0.00027 (0.00019)
Past Discovery	-0.00020 (0.00014)	-0.00022 (0.00015)	-0.00023 (0.00016)	-0.00025 (0.00018)	-0.00027 (0.00020)	-0.00027 (0.00021)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 6: Resource Discovery and Civil Conflict Onset: Within-Grid Effects with Property Rights Institutions as Control

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.00045 (0.000)	-0.00051 (0.000)	-0.00063 (0.001)	-0.00065 (0.001)	-0.00074 (0.001)	-0.00079 (0.001)
Past Discovery	-0.00065 (0.000)	-0.00073 (0.000)	-0.00079 (0.001)	-0.00088 (0.001)	-0.00099 (0.001)	-0.00112 (0.001)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0035** (0.002)	-0.0038* (0.002)	-0.0041** (0.002)	-0.0046** (0.002)	-0.0048** (0.002)	-0.0051** (0.002)
Past Discovery	-0.0025** (0.001)	-0.0025** (0.001)	-0.0026** (0.001)	-0.0031** (0.001)	-0.0032** (0.001)	-0.0034** (0.001)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.00007 (0.000)	-0.00005 (0.000)	-0.00008 (0.000)	-0.00005 (0.000)	-0.00008 (0.000)	-0.00008 (0.000)
Past Discovery	-0.0003 (0.000)	-0.0003 (0.000)	-0.0003 (0.000)	-0.0003 (0.000)	-0.0004 (0.000)	-0.0005 (0.000)
Political Exclusion	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	272,077	260,939	249,801	238,663	227,545	216,429
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1. Political Exclusion is the exclusion of the dominant ethnic group in a particular grid-cell from the state executive. This variable is used as a proxy for property rights institutions assuming that political exclusion would lead to higher expropriation risk for private and state property.

Table 7: First and Single First Resource Discoveries and Civil Conflict Onset

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
<i>MDdt-j: Discovery made in year t-j</i>	Minerals + Oilfield		Mineral Discoveries		Oilfield Discoveries	
	First Discoveries	Single, First Discoveries	First Discoveries	Single, First Discoveries	First Discoveries	Single, First Discoveries
	(1)	(2)	(3)	(4)	(5)	(6)
<i>j</i> =0	-0.00011 (0.000)	-0.00011 (0.000)	-0.00009 (0.000)	-0.00009 (0.000)	-0.00020 (0.000)	-0.00020 (0.000)
<i>j</i> =2	-0.00012 (0.000)	-0.00013 (0.000)	-0.00014 (0.000)	-0.00015 (0.000)	-0.00001 (0.000)	-0.00001 (0.000)
<i>j</i> =4	-0.00020 (0.000)	-0.00023 (0.000)	-0.00026 (0.000)	-0.00029 (0.000)	0.00002 (0.000)	0.00002 (0.000)
<i>j</i> =6	-0.00013 (0.000)	-0.00015 (0.000)	-0.00017 (0.000)	-0.00018 (0.000)	0.00002 (0.000)	0.00002 (0.000)
<i>j</i> =8	-0.00020 (0.000)	-0.00024 (0.000)	-0.00026 (0.000)	-0.00031 (0.000)	0.00002 (0.000)	0.00002 (0.000)
<i>j</i> =10	-0.00022 (0.000)	-0.00027 (0.000)	-0.00028 (0.000)	-0.00035 (0.000)	0.00002 (0.000)	0.00002 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	641,908	641,695	640,546	640,397	633,157	633,093
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of natural resource discoveries on civil conflict onset in a panel of cell-year observations. Cells with pre-existing extraction (mining or oil drilling) activities were dropped from the regression. In column (1), the variable of interest *MDdt-j* is a dummy variable equal to 1 if least one natural resource was discovered *j* years ago, 0 if no discovery has been made and missing for every post-discovery year *j* > 10. In column (2), the dummies are set to missing the year a second discovery was made in the same district. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 8: Natural Resource Discoveries and Civil Conflict Onset (UCDP-GED)

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.007 (0.009)	0.001 (0.012)	-0.022*** (0.007)	-0.008 (0.013)	-0.009 (0.011)	0.010 (0.014)
Past Discovery	-0.0005 (0.004)	-0.0002 (0.005)	0.0022 (0.005)	-0.0009 (0.004)	0.0006 (0.004)	-0.0011 (0.0044)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.005 (0.007)	-0.028 (0.030)	-0.028 (0.030)	-0.029 (0.030)	-0.016 (0.016)	0.010 (0.011)
Past Discovery	0.018 (0.020)	0.022 (0.023)	0.022 (0.023)	0.022 (0.023)	0.020 (0.021)	0.009 (0.009)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.007 (0.010)	0.003 (0.013)	-0.022*** (0.007)	0.011 (0.014)	-0.008 (0.013)	0.002 (0.012)
Past Discovery	-0.002 (0.004)	-0.002 (0.004)	-0.0005 (0.004)	-0.003 (0.004)	-0.001 (0.004)	-0.002 (0.005)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 9: Natural Resource Discoveries and Civil Conflict Onset (ACLED)

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0055 (0.0161)	-0.0061 (0.0149)	-0.0155* (0.0094)	-0.0197* (0.0117)	-0.0006 (0.0199)	0.0194 (0.0227)
Past Discovery	-0.0019 (0.0077)	-0.0008 (0.0077)	0.0002 (0.0082)	0.0002 (0.0079)	-0.0015 (0.0079)	-0.0032 (0.0067)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.1415** (0.0664)	-0.1085*** (0.0389)	-0.0269 (0.0311)	-0.0224 (0.0257)	0.1433 (0.1671)	-0.0015 (0.0205)
Past Discovery	-0.0217 (0.0289)	-0.0028 (0.0175)	-0.0113 (0.0256)	-0.0113 (0.0259)	-0.0299 (0.0377)	-0.0137 (0.0267)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.0021 (0.0148)	0.04e-06 (0.0154)	-0.0148 (0.0098)	-0.0193 (0.0126)	-0.0130 (0.0161)	0.0214 (0.0244)
Past Discovery	-0.0005 (0.0078)	-0.0006 (0.0081)	0.0011 (0.0085)	0.0011 (0.0081)	0.0004 (0.0079)	-0.0024 (0.0067)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 10: Resource Discoveries and Local Economic Development Measured by Luminosity

Dependent Variable: Natural Logarithm of night lights (Luminosity)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Discovery	0.114* (0.063)	0.172* (0.088)	0.104* (0.054)	0.144** (0.065)	0.191** (0.079)	0.184** (0.083)
Past Discovery	0.078 (0.082)	0.107 (0.092)	0.096 (0.084)	0.088 (0.080)	0.070 (0.080)	0.071 (0.083)
PopulationDensity	0.172 (0.126)	0.172 (0.126)	0.172 (0.126)	0.172 (0.126)	0.172 (0.126)	0.172 (0.126)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	215439	206271	197103	187935	178767	169599
Sample Period	1992-2012	1992-2012	1992-2012	1992-2012	1992-2012	1992-2012

Notes: This table reports the effect of discovering at least one natural resource on local economic development in a panel of cell-year observations. The dependent variable is the natural logarithm of luminosity density. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 11: Discoveries, Economic Development and Conflict: Testing the Income Mechanism

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Local Income	-0.0032* (0.0017)	-0.003* (0.0016)	-0.0026* (0.0014)	-0.001 (0.002)	-0.004* (0.002)	-0.003* (0.0017)
Discovery	-0.011 (0.011)	-0.004 (0.013)	-0.020*** (0.007)	0.004 (0.015)	-0.013* (0.007)	-0.003 (0.014)
Past Discovery	0.004 (0.005)	-0.005 (0.005)	-0.007 (0.006)	-0.006 (0.006)	-0.003 (0.007)	-0.004 (0.006)
PopulationDensity	0.001 (0.018)	0.018 (0.018)	0.048*** (0.015)	0.073*** (0.023)	0.074*** (0.021)	0.061*** (0.020)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	194921	186627	178333	170039	161745	153451
Sample Period	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010

Notes: This table reports the effect of discovering at least one natural resource and local economic development on civil conflict in a panel of cell-year observations. The local economic development is natural logarithm of luminosity adjusted for grid surface area. The dependent variable is the onset of civil conflict based on the UCDP GED dataset simple because the sample period matches more with the night lights data. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 12: Natural Resources, Cabinet Size and Military Expenditure

Dependent Variable:	State Cabinet Sizes		Military Expenditure	
	(1)	(2)	(3)	(4)
Resource Discovery	0.4013*** (0.060)	0.5323*** (0.066)	-0.0334*** (0.011)	-0.0538** (0.025)
Ruler Years in Power		0.0586** (0.025)		0.0090 (0.015)
Ongoing Civil War		0.8447* (0.503)		0.9179*** (0.321)
Lagged GDP Growth		0.0377 (0.023)		-0.0207 (0.028)
Lagged Population		0.6236*** (0.200)		-0.0320 (0.146)
Lagged Aid Per Capita		0.0230*** (0.006)		-0.0052 (0.004)
Ethnic Fractionalisation		0.7602 (0.892)		-0.2639 (0.490)
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Observations	813	667	603	276
Sample Period	1960-2004	1960-2004	1988-2012	1988-2012

Notes: In Figure 8, we present a graphical non-parametric association between government cabinet size (the number of cabinet positions), military expenditure and natural resource discovery. This table reports the regression estimations showing the association between natural resources, cabinet sizes and military expenditure at the country level. We also control for important economic and political variables. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 13: Size of Resource Discoveries and Civil Conflict Onset

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Giant Discovery of Natural Resource (Oilfield + Minerals)						
Discovery	-0.00025 (0.000)	-0.00026 (0.000)	-0.00029 (0.000)	-0.00030 (0.000)	-0.00033 (0.000)	-0.00035 (0.000)
Past Discovery	-0.00025 (0.000)	-0.00027 (0.000)	-0.00029 (0.000)	-0.00031 (0.000)	-0.00034 (0.000)	-0.00036 (0.000)
Panel B: Effect of Giant Discovery of Mineral Resources						
Discovery	-0.00002 (0.000)	-0.00002 (0.000)	-0.00002 (0.000)	-0.00002 (0.000)	-0.00001 (0.000)	-0.00001 (0.000)
Past Discovery	-0.00003* (0.000)	-0.00002* (0.000)	-0.00002 (0.000)	-0.00002 (0.000)	-0.00002 (0.000)	-0.00001 (0.000)
Panel C: Effect of Major Mineral Discovery						
Discovery	-0.00038 (0.000)	-0.00032 (0.000)	-0.00036 (0.000)	-0.00039 (0.000)	-0.00042 (0.000)	-0.00045 (0.000)
Past Discovery	-0.00034 (0.000)	-0.00037 (0.000)	-0.00040 (0.000)	-0.00044 (0.000)	-0.00048 (0.000)	-0.00049 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: The table reports the effect of giant and major discoveries in a panel of cell-year observations. Note that all oil discoveries in the dataset are giant whereas mineral discoveries are giant and major. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 14: Natural Resource Discovery, Democracy and Conflict

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)

Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0004* (0.0002)
Discovery * Polity2	0.00002 (0.000)	0.00002 (0.000)	0.00002 (0.000)	0.00002 (0.000)	0.00002 (0.000)	0.00003 (0.000)
Past Discovery	-0.0003 (0.000)	-0.0003 (0.000)	-0.0003 (0.000)	-0.0004 (0.000)	-0.0004 (0.000)	-0.0004 (0.000)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0035*** (0.000)	-0.0037*** (0.000)	-0.0038*** (0.000)	-0.004*** (0.000)	-0.004*** (0.000)	-0.0044*** (0.000)
Discovery * Polity2	-0.0005*** (0.000)	-0.0005*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)
Past Discovery	-0.0006 (0.001)	-0.0006 (0.001)	-0.0007 (0.001)	-0.0007 (0.001)	-0.0008 (0.001)	-0.0008 (0.001)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0002 (0.000)	-0.0002* (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	-0.0003 (0.000)	-0.0003 (0.000)
Discovery * Polity2	0.00004* (0.000)	0.00004 (0.000)	0.00004 (0.000)	0.00004 (0.000)	0.00005 (0.000)	0.00005 (0.000)
Past Discovery	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	-0.0003 (0.000)	-0.0003 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. The dependent variable is civil conflict onset based on the PRIO-GRID conflict. The Polity2 score ranges from -10 to +10, with higher values indicating stronger country-level democratic institutions. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 15: Natural Resource Discoveries and Civil Conflict Onset: Region Level Analysis

Dependent Variable: Number of Grids Experienced Civil Conflict Onset (PRIO-GRID Conflict Dataset)

Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0036** (0.002)	-0.0036** (0.002)	0.0007 (0.003)	-0.0033** (0.001)	0.0009 (0.004)	-0.0031** (0.001)
Past Discovery	-0.0013* (0.001)	-0.0010 (0.001)	-0.0015** (0.001)	-0.0014* (0.001)	-0.0016** (0.001)	-0.0015** (0.001)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0028 (0.003)	-0.0029 (0.003)	-0.0023 (0.002)	-0.0024 (0.002)	-0.0026 (0.002)	-0.0027 (0.002)
Past Discovery	-0.0004 (0.001)	-0.0004 (0.001)	-0.0012 (0.001)	-0.0012 (0.001)	-0.0012 (0.001)	-0.0012 (0.001)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0039** (0.002)	-0.0039** (0.002)	0.0012 (0.004)	-0.0036** (0.002)	0.0015 (0.005)	-0.0032** (0.002)
Past Discovery	-0.0019* (0.001)	-0.0013* (0.001)	-0.0017* (0.001)	-0.0015* (0.001)	-0.0018** (0.001)	-0.0017** (0.001)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25370	24508	23646	22784	21922	21060
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of region-year Observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 16: Natural Resource Discoveries and Civil Conflict Onset: Country Level Analysis

Dependent Variable: Number of Grids Experienced Civil Conflict Onset (PRIO-GRID Conflict Dataset)

Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0107 (0.009)	-0.0042 (0.015)	0.0114 (0.017)	-0.0122 (0.008)	0.0032 (0.011)	-0.0060 (0.010)
Past Discovery	0.0001 (0.002)	-0.0001 (0.002)	-0.0032 (0.002)	-0.0032 (0.002)	-0.0038 (0.002)	-0.0039* (0.002)
Panel B: Effect of Discovering Oilfield						
Discovery	0.0185 (0.024)	0.0173 (0.034)	0.0169 (0.025)	-0.0213* (0.012)	0.0217 (0.029)	-0.0145* (0.008)
Past Discovery	0.0001 (0.001)	-0.0005 (0.002)	-0.0022 (0.002)	-0.0024 (0.002)	-0.0047 (0.004)	-0.0039 (0.003)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0169* (0.010)	-0.0088 (0.013)	0.0099 (0.020)	-0.0106 (0.010)	-0.0004 (0.012)	-0.0048 (0.011)
Past Discovery	-0.0007 (0.004)	-0.0003 (0.004)	-0.0045 (0.003)	-0.0041 (0.003)	-0.0037 (0.004)	-0.0039 (0.003)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2773	2677	2581	2485	2389	2293
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of country-year Observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table 17: Value of Discovery and Civil Conflict Onset

Dependent Variable: Intrastate Civil Conflict Onset			
	(1)	(2)	(3)
	PRIO-GRID Dataset	UCDP GED Dataset	ACLED Dataset
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)			
Discovery x ln (Commodity Price)	-0.000001 (0.000)	-0.000002** (0.000)	-0.0000004 (0.000)
Past Discovery	-0.00024 (0.000)	0.0015 (0.005)	-0.0027 (0.008)
Panel B: Effect of Discovering Oilfield			
Discovery x ln (Oil Price)	-0.000003 (0.000)	0.000001 (0.000)	-0.00018*** (0.000)
Past Discovery	-0.00001 (0.000)	0.0010 (0.004)	-0.00082 (0.011)
Panel C: Effect of Discovering Mineral Resources			
Discovery x ln (Mineral Prices)	-0.000001 (0.000)	-0.000002*** (0.000)	-0.0000004 (0.000)
Past Discovery	-0.00025 (0.000)	0.0015 (0.005)	-0.0022 (0.008)
Year Fixed Effects	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes
Observations	343,392	152,514	110,743
Sample Period	1950-2008	1989-2010	1997-2012

Notes: This table reports the effect of interaction term between the global commodity price and the dummy for natural resource discovery in a panel of cell-year observations. Our commodity prices are natural logarithm of time-varying and cell-specific global commodity price index as defined in section 3.4. The discovery dummy variable here takes the value 0 before discovery and 1 after discovery. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Natural Resources and Conflict in Africa: What Do the Data Show?

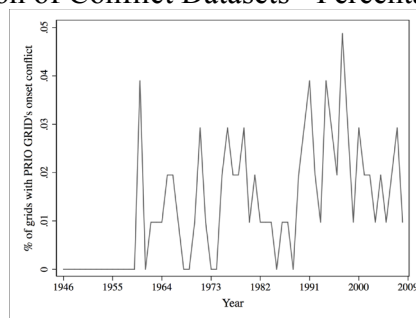
Sambit Bhattacharyya and Nemera Mamo¹

16 May, 2019

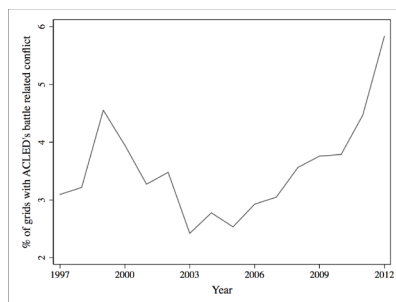
Online Appendix

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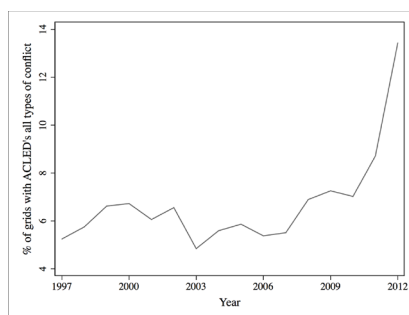
Figure A.1: Comparison of Conflict Datasets - Percentage of Grids in Conflict



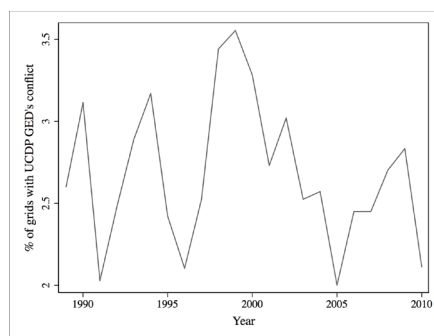
(a) PRIO-GRID Onset Conflict



(b) ACLED Battle related conflict



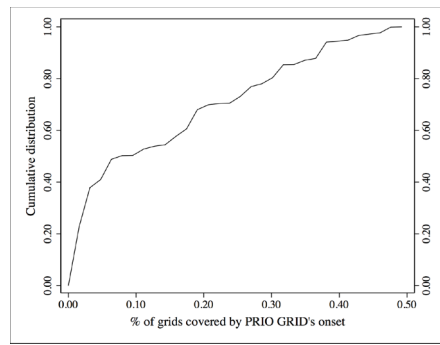
(c) ACLED All conflict



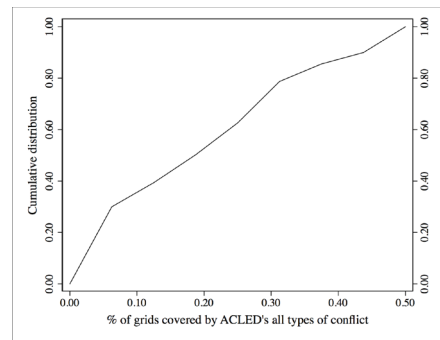
(d) UCDP GED conflict

Notes: The figures show the comparison PRIO-GRID, ACLED and UCDP GED conflict datasets. It represents the percentage of grids in conflict. Note that for ACLED, we show both battle related conflict and all types of conflict.

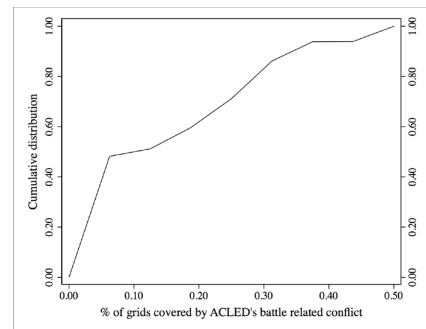
Figure A.2: Comparison of Conflict Datasets - Distribution of Grids in Conflict



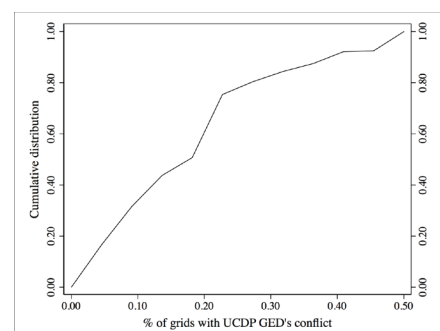
(a) PRIO-GRID Onset Conflict



(b) ACLED All conflict



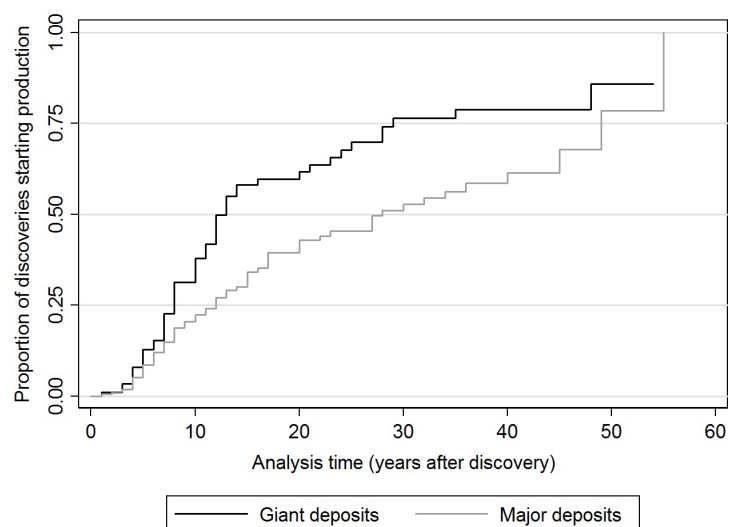
(c) ACLED Battle related conflict



(d) UCDP GED conflict

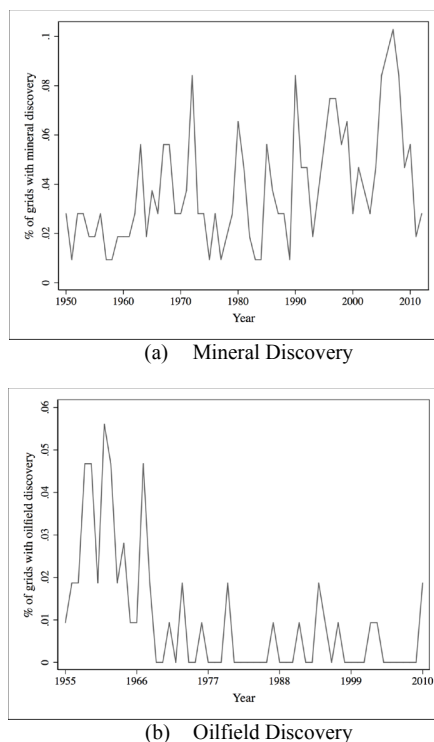
Notes: The figures show the comparison PRIO-GRID, ACLED and UCDP GED conflict datasets. It represents the distribution of grids in conflict when the country is in armed conflict. Note that for ACLED, we show both battle related conflict and all types of conflict.

Figure A.3: Kaplan Meier Probability Estimate for Mineral Discoveries Entering Production



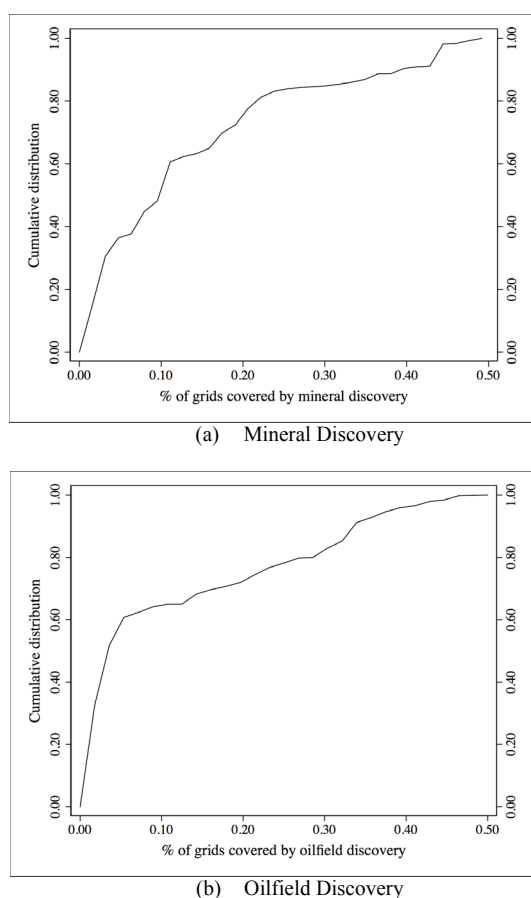
Notes: This graph shows the proportion of discoveries entering production as a function of time after discovery. The Kaplan Meier estimator is used because mine start-ups are not observed for years after 2012 and therefore right censored. Data for discoveries and mine start-ups 1950-2012 from MinEx.

Figure A.4: Minerals and Oilfield Discovery - Percentage of Grids with Discovery



Notes: The figures show the percentage of grids discovered minerals or oilfield.

Figure A.5: Minerals and Oilfield Discovery - Distribution of Grids with Discovery



Notes: The figures show the distribution of grids discovered minerals or oilfield when the country has discovered.

Table A.1: Descriptive Statistics of Primary Commodity
MinEx Mineral Resource Discovery

Primary Metal	Share	Largest Country	Country Share
Copper	0.103	DRC	0.482
Diamonds	0.053	Angola and Botswana	0.286
Fluorite	0.004	South Africa	1.000
Gold	0.479	South Africa	0.222
Graphite	0.004	Tanzania	1.000
Lead	0.004	South Africa	1.000
Manganese	0.030	South Africa	0.625
Mineral Sands	0.030	Madagascar, Mozambique, Sierra Leone and South Africa	0.250
Nickel	0.095	South Africa, Tanzania and Zimbabwe	0.160
Niobium	0.008	Gabon and Tanzania	0.500
PGE	0.068	South Africa	0.944
Phosphate	0.004	Rep of Congo	1.000
Platinum	0.015	South Africa	0.750
Potash	0.008	Rep of Congo	1.000
Rare Earths	0.011	South Africa	0.667
Silver	0.004	South Africa	1.000
Uranium	0.053	Namibia	0.500
Zinc	0.019	Namibia and South Africa	0.400
Zircon	0.008	Madagascar and Senegal	0.500
Mike Horn Oilfield Discovery			
Field Type	Share	Largest Country	Country Share
Oil	0.780	Libya	0.522
Gas	0.220	Algeria	0.538

Notes: Sample Period: 1950-2012. Primary Metal: primary mine deposit discovered. Field Type: the type of deposits - oilfields or natural gas fields. Share: share of primary commodity in the total sample of the discovery. Largest Country: country with the largest share of the primary mine discovered. Country Share: share of the country in the total sample.

Table A.2: Descriptive Statistics at the Country Level - MinEx Mineral Discovery

Country	Discovery	Max Disc	Share1	Share2	Country	Discovery	Max Disc	Share1	Share2
Algeria	1	1	0.001	0.004	Liberia	3	1	0.071	0.012
Angola	5	1	0.012	0.019	Madagascar	4	1	0.019	0.016
Botswana	11	2	0.057	0.043	Mali	13	3	0.030	0.050
Burkina Faso	17	3	0.185	0.066	Mauritania	2	1	0.005	0.008
Burundi	1	1	0.125	0.004	Mozambique	3	2	0.011	0.012
Cameroon	1	1	0.007	0.004	Namibia	12	2	0.040	0.047
CAR	2	1	0.010	0.008	Niger	4	1	0.010	0.016
DRC	19	3	0.025	0.074	Rep of Congo	3	1	0.028	0.012
Cote d'Ivoire	7	1	0.067	0.027	Senegal	6	2	0.082	0.023
Egypt	3	1	0.009	0.012	Sierra Leone	2	1	0.100	0.008
Eritrea	1	1	0.024	0.004	South Africa	67	4	0.141	0.260
Ethiopia	3	1	0.008	0.012	Sudan	1	1	0.001	0.004
Gabon	4	1	0.044	0.016	Tanzania	21	3	0.070	0.081
Ghana	13	2	0.160	0.050	Togo	1	1	0.063	0.004
Guinea	9	3	0.105	0.035	Zambia	7	2	0.028	0.027
Lesotho	1	1	0.063	0.004	Zimbabwe	10	2	0.074	0.039

Notes: Sample Period: 1950-2012. Country: country which discovered mine deposit. Discovery: total number of discovery in the country over the sample period. Max Disc: maximum number of yearly discovery in the country over the sample period. Share1: share of grids in the country discovered at least one mine deposit over the sample period. Share2: country's share of mineral discovery in the African continent over the sample period.

Table A.3: Descriptive Statistics at the Country Level - Mike Horn Oilfield Discovery

Country	Discovery	Max Disc	Share1	Share2
Algeria	11	2	0.013	0.186
Egypt	1	1	0.003	0.017
Ethiopia	1	1	0.003	0.017
Gabon	1	1	0.011	0.017
Libya	27	5	0.046	0.458
Morocco	1	1	0.006	0.017
Nigeria	14	4	0.045	0.237
Rep of Congo	1	1	0.009	0.017
Sudan	2	1	0.002	0.034

Notes: Sample Period: 1950-2012. Country: country which discovered oilfield deposit. Discovery: total number of discovery in the country over the sample period. Max Disc: maximum number of yearly discovery in the country over the sample period. Share1: share of grids in the country discovered at least one oilfield over the sample period. Share2: country's share of mineral discovery in the African continent over the sample period.

Table A.4: Descriptive Statistics at the Country Level - PRIO-GRID

Country	Events	Max Events	Share1	Share2	Country	Events	Max Events	Share1	Share2
Algeria	1	1	0.0001	0.012	Liberia	1	1	0.0001	0.012
Angola	3	1	0.0003	0.036	Madagascar	1	1	0.0003	0.012
Burkina Faso	1	1	0.0001	0.012	Mali	2	1	0.0001	0.024
Cameroon	3	1	0.0003	0.036	Morocco	2	1	0.0003	0.024
CAR	1	1	0.0001	0.012	Namibia	1	1	0.0001	0.012
Chad	3	1	0.0003	0.036	Niger	6	1	0.0003	0.071
Cote d'Ivoire	2	1	0.0002	0.024	Rwanda	2	1	0.0002	0.024
DRC	12	1	0.001	0.143	Nigeria	3	1	0.001	0.036
Equatorial Guinea	3	3	0.0003	0.036	Senegal	1	1	0.0003	0.012
Eritrea	2	1	0.0002	0.024	Somalia	6	1	0.0002	0.071
Ethiopia	5	2	0.0005	0.060	Sudan	5	1	0.0005	0.060
Ghana	3	1	0.0003	0.036	Tanzania	1	1	0.0003	0.012
Guinea	2	1	0.0002	0.024	Tunisia	1	1	0.0002	0.012
Guinea Bissau	5	2	0.0005	0.060	Uganda	1	1	0.0005	0.012
Kenya	1	1	0.0001	0.012	Zambia	1	1	0.0001	0.012
Lesotho	1	1	0.0001	0.012	Zimbabwe	2	1	0.0001	0.024

Notes: Sample Period: 1946-2008. Country: country in which the conflict event took place. Events: total number of events in the country over the sample period. Max Events: maximum number of yearly events in the country over the sample period. Share1: share of grids in the country affected by at least one conflict over the sample period. Share2: country's share of conflict events in the African continent over the sample period.

Table A.5: Descriptive Statistics at the Country Level – ACLED

Country	Events	Max Events	Share1	Share2	Country	Events	Max Events	Share1	Share2
Algeria	1366	274	0.108	0.045	Madagascar	54	23	0.088	0.002
Angola	2178	1215	0.368	0.071	Malawi	5	2	0.143	0.0002
Benin	2	1	0.056	0.0001	Mali	321	165	0.098	0.011
Botswana	3	1	0.015	0.0001	Mauritania	16	5	0.024	0.001
Burkina Faso	23	6	0.207	0.001	Morocco	12	5	0.025	0.0004
Burundi	1479	363	1.000	0.049	Mozambique	46	23	0.032	0.002
Cameroon	77	14	0.157	0.003	Namibia	80	50	0.060	0.003
CAR	481	122	0.284	0.016	Niger	148	34	0.091	0.005
Chad	309	73	0.128	0.010	Nigeria	1785	318	0.534	0.059
Cote d'Ivoire	478	111	0.343	0.016	Rep of Congo	190	70	0.239	0.006
DRC	3847	407	0.361	0.126	Rwanda	144	77	0.750	0.005
Djibouti	18	5	0.500	0.001	Senegal	232	31	0.247	0.008
Egypt	513	343	0.083	0.017	Sierra Leone	838	286	1.000	0.028
Equatorial Guinea	7	4	0.053	0.0002	Somalia	6927	1928	0.612	0.227
Eritrea	234	142	0.357	0.008	South Africa	88	26	0.067	0.003
Ethiopia	1261	179	0.496	0.041	Sudan	1529	336	0.305	0.050
Gabon	3	1	0.033	0.0001	Swaziland	1	1	0.375	0.00003
Ghana	64	11	0.222	0.002	Tanzania	46	11	0.083	0.002
Guinea	171	61	0.233	0.006	Togo	11	4	0.750	0.0004
Guinea-Bissau	110	63	0.471	0.004	Tunisia	110	54	0.352	0.004
Kenya	1023	122	0.556	0.034	Uganda	1734	297	0.813	0.057
Lesotho	26	17	0.250	0.001	Zambia	20	4	0.044	0.001
Liberia	586	194	0.738	0.019	Zimbabwe	59	10	0.103	0.002
Libya	816	505	0.070	0.027					

Notes: Sample Period: 1997-2012. Country: country in which the conflict event took place. Events: total number of events in the country over the sample period. Max Events: maximum number of yearly events in the country over the sample period. Share1: share of grids in the country affected by at least one conflict over the sample period. Share2: country's share of conflict events in the African continent over the sample period.

Table A.6: Descriptive Statistics at the Country Level - UCDP GED

Country	Events	Max Events	Share1	Share2	Country	Events	Max Events	Share1	Share2
Algeria	3591	383	0.128	0.148	Mali	104	41	0.084	0.004
Angola	1912	316	0.438	0.079	Mauritania	20	12	0.021	0.001
Botswana	1	1	0.011	0.0000004	Morocco	10	6	0.019	0.0004
Burundi	1387	193	1.000	0.057	Mozambique	263	131	0.276	0.011
Cameroon	45	8	0.092	0.002	Namibia	24	17	0.050	0.001
CAR	195	52	0.160	0.008	Niger	90	22	0.096	0.004
Chad	298	62	0.133	0.012	Nigeria	428	78	0.296	0.018
Comoros	6	3	0.152	0.0002	Rep of Congo	214	55	1.000	0.009
Cote d'Ivoire	162	47	0.264	0.007	Senegal	282	39	0.233	0.012
DRC	2001	547	0.211	0.083	Rwanda	467	161	1.000	0.019
Djibouti	44	10	0.625	0.002	Sierra Leone	1468	347	0.372	0.061
Egypt	373	117	0.075	0.015	Somalia	1943	316	0.261	0.080
Eritrea	43	13	0.429	0.002	South Africa	2781	576	0.250	0.115
Ethiopia	1351	144	0.499	0.056	Sudan	1766	223	0.750	0.073
Ghana	38	10	0.173	0.002	Swaziland	2	2	0.027	0.0001
Guinea	68	26	0.186	0.003	Tanzania	7	3	0.500	0.0003
Guinea-Bissau	12	9	0.412	0.001	Togo	96	83	0.019	0.004
Kenya	423	119	0.317	0.018	Tunisia	1	1	0.813	0.0000004
Lesotho	5	5	0.438	0.0002	Uganda	1655	251	0.054	0.068
Liberia	545	137	0.905	0.023	Zambia	12	6	0.032	0.001
Madagascar	39	32	0.037	0.002	Zimbabwe	53	40	0.184	0.002

Notes: Sample Period: 1989-2010. Country: country in which the conflict event took place. Events: total number of events in the country over the sample period. Max Events: maximum number of yearly events in the country over the sample period. Share1: share of grids in the country affected by at least one conflict over the sample period. Share2: country's share of conflict events in the African continent over the sample period.

Table A.7: Past Discoveries and Near Future Discoveries: Region Level

Dependent Variable:	Natural Resource Discovery		Oilfield Discovery		Mineral Discovery	
	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled OLS	FE	Pooled OLS	FE	Pooled OLS	FE
Past Discovery	0.04381*** (0.005)	0.01686** (0.007)	0.04332*** (0.004)	0.03022*** (0.006)	0.04505*** (0.007)	0.00838 (0.006)
Year Fixed Effects	No	Yes	No	Yes	No	Yes
Region Fixed Effects	No	Yes	No	Yes	No	Yes
Region-Specific Time Trend	No	Yes	No	Yes	No	Yes
Country x Year Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	27090	27090	27090	27090	27090	27090
Sample Period	1950-2012	1950-2012	1950-2012	1950-2012	1950-2012	1950-2012

Notes: This table reports whether discoveries in a region's recent past raise the odds of additional discoveries in its near future. The explanatory variable (past discovery) is the number of years with discoveries from t-10 to t-1. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.8: Past Discoveries and Near Future Discoveries: Country Level

Dependent Variable:	Natural Resource Discovery		Oilfield Discovery		Mineral Discovery	
	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled OLS	FE	Pooled OLS	FE	Pooled OLS	FE
Past Discovery	0.0538*** (0.004)	0.0279*** (0.007)	0.0454*** (0.001)	0.0328*** (0.002)	0.0596*** (0.002)	0.0218* (0.012)
Year Fixed Effects	No	Yes	No	Yes	No	Yes
Country Fixed Effects	No	Yes	No	Yes	No	Yes
Country x Year Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	2961	2961	2961	2961	2961	2961
Sample Period	1950-2012	1950-2012	1950-2012	1950-2012	1950-2012	1950-2012

Notes: This table reports whether discoveries in a country's recent past raise the odds of additional discoveries in its near future. The explanatory variable (past discovery) is the number of years with discoveries from t-10 to t-1. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.9: Resource Discoveries and Civil Conflict Onset: First Resource Discoveries

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
<i>MD_{dt-j}: Discovery made in year t-j</i>	Minerals + Oilfield		Mineral Discoveries		Oilfield Discoveries	
	First Discoveries	Single, First Discoveries	First Discoveries	Single, First Discoveries	First Discoveries	Single, First Discoveries
	(1)	(2)	(3)	(4)	(5)	(6)
<i>j</i> = 0	-0.01619 (0.000)	-0.01602** (0.006)	-0.01594 (0.000)	-0.01577 (0.000)	-0.01742 (0.013)	-0.01791 (0.000)
<i>j</i> = 2	-0.00123 (0.000)	-0.00039 (0.013)	-0.00053 (0.000)	0.00039 (0.000)	-0.00977 (0.011)	-0.01199 (0.000)
<i>j</i> = 4	-0.03028 (0.000)	-0.03179** (0.013)	-0.03051 (0.000)	-0.03217 (0.000)	-0.02280* (0.013)	-0.02126 (0.000)
<i>j</i> = 6	-0.00995 (0.000)	-0.00999 (0.020)	-0.00906 (0.000)	-0.00895 (0.000)	-0.01716 (0.014)	-0.01867 (0.000)
<i>j</i> = 8	-0.01240 (0.000)	-0.01331 (0.017)	-0.01263 (0.000)	-0.01376 (0.000)	-0.00465 (0.008)	-0.00091 (0.000)
<i>j</i> = 10	-0.00415 (0.000)	-0.00512 (0.023)	-0.01061 (0.000)	-0.01237 (0.000)	0.06998 (0.075)	0.08361 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	220,058	219,985	219,939	219,876	218,034	218,024
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of natural resource discoveries on civil conflict onset in a panel of cell-year observations. Cells with pre-existing extraction (mining or oil drilling) activities were dropped from the regression. In column (1), the variable of interest *MD_{dt-j}* is a dummy variable equal to 1 if least one natural resource was discovered *j* years ago, 0 if no discovery has been made and missing for every post-discovery year *j* > 10. In column (2), the dummies are set to missing the year a second discovery was made in the same district. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.10: Resource Discoveries and Civil Conflict Onset: First Resource Discoveries

Dependent Variable: Intrastate Civil Conflict Onset (UCD-GED Conflict Dataset)						
MD_{dt-j} : Discovery made in year $t-j$	Minerals + Oilfield		Mineral Discoveries		Oilfield Discoveries	
	First Discoveries (1)	Single, First Discoveries (2)	First Discoveries (3)	Single, First Discoveries (4)	First Discoveries (5)	Single, First Discoveries (6)
$j=0$	-0.01309 (0.000)	-0.01316 (0.000)	-0.00103 (0.017)	-0.00102 (0.000)	-0.22061 (0.000)	-0.22052 (0.000)
$j=2$	-0.01867 (0.000)	-0.01953 (0.000)	-0.00695 (0.014)	-0.00689 (0.000)	-0.22617 (0.000)	-0.22606 (0.000)
$j=4$	-0.01463 (0.000)	-0.01287 (0.000)	-0.00881 (0.011)	-0.00627 (0.000)	-0.15172 (0.000)	-0.16376 (0.000)
$j=6$	-0.02387 (0.000)	-0.02227 (0.000)	-0.01785 (0.012)	-0.01571 (0.000)	-0.15400 (0.000)	-0.15541 (0.000)
$j=8$	-0.00533 (0.000)	-0.00225 (0.000)	-0.01510 (0.013)	-0.01260 (0.000)	0.05778 (0.000)	0.10171 (0.000)
$j=10$	0.03640 (0.000)	0.04396 (0.000)	0.04424 (0.038)	0.05179 (0.000)	-0.12524 (0.000)	-0.12060 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	159,357	159,297	159,280	159,228	158,171	158,163
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of natural resource discoveries on civil conflict onset in a panel of cell-year observations. Cells with pre-existing extraction (mining or oil drilling) activities were dropped from the regression. In column (1), the variable of interest MD_{dt-j} is a dummy variable equal to 1 if least one natural resource was discovered j years ago, 0 if no discovery has been made and missing for every post-discovery year $j > 10$. In column (2), the dummies are set to missing the year a second discovery was made in the same district. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.11: Natural Resource Discoveries and Civil Conflict Incidence - Within-Grids Effect

Dependent Variable: Intrastate Civil Conflict Incidence (UCDP-GED Conflict						
Outcome at:	(1) t	(2) t+2	(3) t+4	(4) t+6	(5) t+8	(6) t+10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.012 (0.015)	-0.010 (0.014)	-0.018 (0.013)	0.007 (0.016)	-0.002 (0.016)	0.009 (0.015)
Past Discovery	-0.010 (0.008)	-0.008 (0.009)	-0.007 (0.008)	-0.010 (0.008)	-0.009 (0.007)	-0.010 (0.008)
Panel B: Effect of Discovering Oilfield						
Discovery	0.075 (0.080)	-0.024 (0.025)	-0.024 (0.025)	-0.024 (0.025)	-0.011 (0.011)	0.087 (0.089)
Past Discovery	0.017 (0.014)	0.015 (0.014)	0.016 (0.017)	0.016 (0.017)	0.014 (0.015)	0.005 (0.005)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.018 (0.016)	-0.009 (0.015)	-0.018 (0.013)	0.009 (0.017)	-0.001 (0.017)	0.002 (0.014)
Past Discovery	-0.012 (0.008)	-0.010 (0.009)	-0.009 (0.009)	-0.012 (0.009)	-0.011 (0.008)	-0.011 (0.009)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from $t-10$ to $t-1$.

Table A.12: Natural Resource Discoveries and Civil Conflict Intensity - Within-Grids Effect

Dependent Variable: Intrastate Civil Conflict Intensity (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.035* (0.018)	-0.014 (0.020)	-0.006 (0.025)	0.005 (0.018)	-0.002 (0.016)	0.004 (0.017)
Past Discovery	-0.017 (0.013)	-0.014 (0.014)	-0.015 (0.013)	-0.16 (0.13)	-0.015 (0.012)	-0.016 (0.014)
Panel B: Effect of Discovering Oilfield						
Discovery	0.028 (0.115)	-0.013 (0.013)	-0.012 (0.013)	-0.012 (0.013)	-0.0004 (0.002)	0.043 (0.045)
Past Discovery	0.002 (0.006)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.001 (0.001)	-0.003 (0.004)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.039* (0.017)	-0.014 (0.021)	-0.005 (0.030)	0.006 (0.019)	-0.002 (0.017)	0.001 (0.018)
Past Discovery	-0.019 (0.014)	-0.015 (0.015)	-0.016 (0.014)	-0.017 (0.014)	-0.017 (0.013)	-0.0017 (0.015)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.13: Natural Resource Discoveries and Civil Conflict Incidence - Within Grids Effect

Dependent Variable: Intrastate Civil Conflict Incidence (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0197 (0.0241)	-0.0137 (0.0181)	-0.0015 (0.0136)	-0.0272** (0.0109)	0.0054 (0.0188)	0.0147 (0.0278)
Past Discovery	-0.008 (0.013)	-0.005 (0.012)	-0.007 (0.012)	-0.005 (0.012)	-0.007 (0.012)	-0.008 (0.012)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.1873** (0.0893)	-0.1394** (0.0553)	-0.0431 (0.0476)	-0.0353 (0.0399)	0.1301 (0.1499)	0.0033 (0.0231)
Past Discovery	-0.032 (0.036)	-0.008 (0.020)	-0.018 (0.030)	-0.018 (0.031)	-0.036 (0.041)	-0.022 (0.032)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0105 (0.0227)	-0.0063 (0.0183)	0.0009 (0.0142)	-0.0264** (0.0117)	-0.0049 (0.0158)	0.0159 (0.0300)
Past Discovery	-0.007 (0.013)	-0.005 (0.013)	-0.006 (0.013)	-0.003 (0.013)	-0.005 (0.012)	-0.007 (0.012)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.14: Natural Resource Discoveries and Civil Conflict Intensity - Within Grids Effect

Dependent Variable: Intrastate Civil Conflict Intensity (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0142 (0.0336)	-0.0479* (0.0277)	0.0259 (0.0329)	-0.0024 (0.0299)	0.0237 (0.0282)	-0.0067 (0.0339)
Past Discovery	-0.001 (0.018)	0.006 (0.019)	-0.003 (0.017)	0.000 (0.016)	-0.002 (0.017)	0.001 (0.018)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.1774** (0.0854)	-0.1416** (0.0545)	-0.0535 (0.0497)	-0.0453 (0.0417)	0.1859 (0.2198)	-0.0066 (0.0244)
Past Discovery	-0.022 (0.033)	0.002 (0.020)	-0.007 (0.029)	-0.007 (0.030)	-0.033 (0.044)	-0.012 (0.031)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0052 (0.0336)	-0.0425 (0.0291)	0.0307 (0.0348)	0.0010 (0.0322)	0.0102 (0.0177)	-0.0066 (0.0368)
Past Discovery	0.001 (0.020)	0.006 (0.021)	-0.002 (0.018)	0.001 (0.017)	0.000 (0.018)	0.002 (0.019)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.15: Resource Discoveries and Civil Conflict Onset: Time-varying distance from discovery - do we expect conflict occurring far away from oilfield or mines?

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Distance from Discovery (km)	-0.00002 (0.000)	-0.00001 (0.000)	-0.00004 (0.000)	-0.00001 (0.000)	-0.00002 (0.000)	0.00001 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Distance from discovery is time-varying distance of grid's centroid from the nearest discovery field each year.

Table A.16: Resource Discoveries and Civil Conflict Onset: Time-varying distance from discovery - do we expect conflict occurring far away from oilfield or mines?

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Distance from Discovery (km)	0.00052 (0.002)	0.00025 (0.002)	0.00164 (0.001)	0.00039 (0.001)	-0.00135 (0.001)	-0.00021 (0.002)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Distance from discovery is time-varying distance of grid's centroid from the nearest discovery field each year.

Table A.17: Resource Discoveries and Civil Conflict Onset: Time-varying distance from discovery - do we expect conflict occurring far away from oilfield or mines?

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Distance from Discovery (km)	-0.0010 (0.001)	-0.0012 (0.001)	-0.0016 (0.001)	-0.0026* (0.001)	-0.00067 (0.001)	-0.00162 (0.001)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Distance from discovery is time-varying distance of grid's centroid from the nearest discovery field each year.

Table A.18: Resource Discoveries and Civil Conflict Onset: Proximity to the borders: proximity to borders is known to be an indicator for conflict propensity

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Distance to the Border, $\leq 25km$						
Discovery	-0.00048 (0.000)	0.00005* (0.000)	0.00003* (0.000)	0.00001 (0.000)	-0.00005 (0.000)	-0.00012 (0.000)
Observations	71449	68409	65369	62329	59289	56249
Panel B: Distance to the Border, $\leq 50km$						
Discovery	-0.00084* (0.000)	0.00006* (0.000)	0.00002 (0.000)	0.00000 (0.000)	-0.00007 (0.000)	-0.00013** (0.000)
Observations	132986	127327	121668	116009	110350	104691
Panel C: Distance to the Border, $\leq 100km$						
Discovery	-0.00055 (0.000)	0.00005 (0.000)	0.00002** (0.000)	-0.00000 (0.000)	-0.00004 (0.000)	-0.00008 (0.000)
Observations	237298	227201	217104	207007	196910	186813
Panel D: Distance to the Border, $< 100km$						
Discovery	-0.00046 (0.000)	0.00004 (0.000)	0.00002** (0.000)	0.00001 (0.000)	-0.00003 (0.000)	-0.00010 (0.000)
Past Discovery	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	392055	375372	358689	342006	325323	308640
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.19: Resource Discoveries and Civil Conflict Onset: Proximity to the borders: proximity to borders is known to be an indicator for conflict propensity.

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Distance to the Border, <= 25km						
Discovery	-0.031** (0.015)	-0.011 (0.017)	0.027 (0.043)	0.027 (0.050)	-0.023* (0.012)	-0.0021 (0.071)
Observations	18936	18130	17324	16518	15712	14906
Panel B: Distance to the Border, <= 50km						
Discovery	-0.030** (0.012)	-0.028 (0.021)	0.0015 (0.028)	0.0027 (0.034)	-0.024** (0.011)	-0.021 (0.036)
Observations	35269	33768	32267	30766	29265	27764
Panel C: Distance to the Border, <= 100km						
Discovery	-0.007 (0.024)	-0.006 (0.022)	-0.008 (0.019)	-0.008 (0.022)	-0.019** (0.009)	-0.015 (0.021)
Observations	63076	60392	57708	55024	52340	49656
Panel D: Distance to the Border, < 100km						
Discovery	-0.017 (0.016)	-0.002 (0.017)	-0.013 (0.011)	-0.012 (0.013)	0.011 (0.023)	0.019 (0.024)
Past Discovery	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	104550	100101	95652	91203	86754	82305
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.20: Resource Discoveries and Civil Conflict Onset: Proximity to the borders: proximity to borders is known to be an indicator for conflict propensity.

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Distance to the Border, <= 25km						
Discovery	-0.303* (0.176)	-0.186 (0.152)	-0.149 (0.152)	0.013 (0.213)	-0.043 (0.154)	-0.29* (0.151)
Observations	26642	25508	24374	23240	22106	20972
Panel B: Distance to the Border, <= 50km						
Discovery	-0.166 (0.120)	-0.02 (0.157)	-0.137 (0.104)	-0.022 (0.142)	-0.058 (0.097)	-0.207* (0.106)
Observations	49588	47478	45368	43258	41148	39038
Panel C: Distance to the Border, <= 100km						
Discovery	-0.135 (0.091)	0.0012 (0.095)	-0.086 (0.062)	-0.0187 (0.080)	-0.029 (0.062)	-0.119* (0.067)
Observations	88484	84719	80954	77189	73424	69659
Panel D: Distance to the Border, < 100km						
Discovery	-0.126* (0.065)	-0.045 (0.065)	0.083 (0.169)	-0.014 (0.059)	-0.032 (0.043)	-0.015 (0.061)
Past Discovery	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	146190	139969	133748	127527	121306	115085
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.21: Resource Discoveries and Civil Conflict Onset: Higher levels of aggregation - is there evidence for an ecological inference fallacy?

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0009** (0.000)	0.00003 (0.000)	-0.00004 (0.000)	0.00003 (0.000)	0.00005 (0.000)	-0.00000 (0.000)
Past Discovery	-0.0008* (0.000)	-0.0008* (0.000)	-0.0008* (0.000)	-0.0008* (0.000)	-0.0009* (0.000)	-0.0009* (0.000)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0017 (0.002)	0.00006 (0.000)	0.00002 (0.000)	0.0002 (0.000)	0.0001 (0.000)	-0.0004 (0.000)
Past Discovery	-0.0016 (0.001)	-0.0016 (0.001)	-0.0016 (0.001)	-0.0017 (0.002)	-0.00173 (0.002)	-0.0018 (0.002)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0007** (0.000)	0.000001 (0.000)	-0.00005 (0.000)	-0.00001 (0.000)	0.00005 (0.000)	0.00013 (0.000)
Past Discovery	-0.0006* (0.000)	-0.0006* (0.000)	-0.0006* (0.000)	-0.0006* (0.000)	-0.0006* (0.000)	-0.0006* (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	155524	148906	142288	135670	129052	122434
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.22: Resource Discoveries and Civil Conflict Onset: Higher levels of aggregation - is there evidence for an ecological inference fallacy?

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.006 (0.016)	0.002 (0.020)	0.014 (0.014)	0.002 (0.019)	-0.001 (0.017)	0.012 (0.018)
Past Discovery	-0.0009 (0.008)	-0.0009 (0.007)	-0.002 (0.007)	-0.0008 (0.008)	-0.0005 (0.008)	-0.0016 (0.007)
Panel B: Effect of Discovering Oilfield						
Discovery	0.09 (0.127)	-0.06** (0.029)	-0.018 (0.016)	-0.031 (0.022)	0.131 (0.156)	-0.033 (0.022)
Past Discovery	-0.017 (0.024)	-0.012 (0.022)	-0.019 (0.025)	-0.017 (0.025)	-0.033 (0.039)	-0.017 (0.025)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.011 (0.016)	0.007 (0.021)	0.015 (0.015)	0.004 (0.019)	-0.01 (0.014)	0.016 (0.020)
Past Discovery	0.0003 (0.008)	-0.00003 (0.007)	-0.001 (0.008)	0.0004 (0.008)	0.002 (0.008)	-0.0005 (0.008)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23724	22715	21706	20697	19688	18679
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.23: Resource Discoveries and Civil Conflict Onset: Higher levels of aggregation - is there evidence for an ecological inference fallacy?

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.037* (0.021)	-0.013 (0.014)	-0.009 (0.017)	0.009 (0.015)	-0.007 (0.019)	0.008 (0.015)
Past Discovery	0.00418 (0.005)	0.00401 (0.005)	0.00355 (0.006)	0.00154 (0.004)	0.00303 (0.005)	0.00176 (0.005)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.07 (0.061)	-0.07* (0.044)	-0.015 (0.030)	-0.016 (0.032)	-0.003 (0.025)	0.12 (0.108)
Past Discovery	-0.004 (0.023)	0.008 (0.021)	0.0002 (0.024)	0.0003 (0.024)	-0.0009 (0.024)	-0.013 (0.017)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.04* (0.023)	-0.009 (0.013)	-0.009 (0.018)	0.011 (0.016)	-0.007 (0.020)	-0.0003 (0.015)
Past Discovery	0.00478 (0.005)	0.00381 (0.005)	0.00384 (0.006)	0.00169 (0.004)	0.00334 (0.005)	0.00280 (0.005)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55820	53445	51070	48695	46320	43945
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.24: Natural Resource Discoveries and Civil Conflict Onset - Region Level Analysis

Dependent Variable: Number of Grids Experienced Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.1418 (0.229)	-0.1288 (0.277)	0.0518 (0.156)	-0.0037 (0.126)	0.3508 (0.272)	-0.0075 (0.137)
Past Discovery	0.0570 (0.084)	0.0766 (0.098)	0.0577 (0.077)	0.0637 (0.079)	0.0439 (0.077)	0.0638 (0.088)
Panel B: Effect of Discovering Oilfield						
Discovery	2.3318 (3.997)	0.2978 (1.756)	-1.7738 (1.476)	-0.1466 (0.370)	0.8011 (1.290)	-0.2219 (0.243)
Past Discovery	0.0533 (0.538)	-0.0615 (0.242)	0.0982 (0.385)	-0.0239 (0.414)	-0.1086 (0.464)	-0.0235 (0.401)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.3008 (0.210)	-0.1712 (0.264)	0.1583 (0.131)	0.0067 (0.132)	0.3191 (0.279)	0.0113 (0.145)
Past Discovery	0.0581 (0.072)	0.0898 (0.099)	0.0538 (0.068)	0.0714 (0.070)	0.0553 (0.067)	0.0713 (0.082)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6912	6048	5184	4320	3456	2592
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of region-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.25: Natural Resource Discoveries and Civil Conflict Onset - Region Level Analysis

Dependent Variable: Number of Grids Experienced Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.3128 (0.262)	-0.0357 (0.144)	0.2964 (0.351)	0.1780 (0.127)	-0.1392 (0.088)	-0.0661 (0.229)
Past Discovery	0.1534 (0.144)	0.1454 (0.150)	0.1122 (0.107)	0.1281 (0.140)	0.1507 (0.142)	0.1463 (0.153)
Panel B: Effect of Discovering Oilfield						
Discovery	2.18957 (2.696)	-0.81107 (0.677)	-0.31285 (0.344)	1.00891 (0.854)	0.03216 (0.045)	0.34918 (0.502)
Past Discovery	0.1365 (0.085)	0.1329* (0.068)	0.0910** (0.042)	-0.0200 (0.081)	0.0623* (0.036)	0.0436 (0.063)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.1723 (0.187)	0.0130 (0.146)	0.3369 (0.373)	0.1145 (0.124)	-0.1485 (0.092)	-0.1016 (0.252)
Past Discovery	0.1574 (0.159)	0.1493 (0.166)	0.1169 (0.120)	0.1423 (0.154)	0.1602 (0.156)	0.1581 (0.168)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9504	8640	7776	6912	6048	5184
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of region-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.26: Natural Resource Discoveries and Civil Conflict Onset - Country Level Analysis

Dependent Variable: Number of Grids Experienced Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.1992* (0.117)	0.0623 (0.093)	0.0849 (0.081)	-0.0234 (0.078)	-0.0264 (0.101)	0.0852 (0.168)
Past Discovery	-0.0618 (0.037)	-0.0653* (0.037)	-0.0668* (0.037)	-0.0582 (0.038)	-0.0584 (0.035)	-0.0625* (0.036)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.6504* (0.331)	-0.3020 (0.304)	-0.0692 (0.181)	0.5262 (0.681)	-0.8157* (0.478)	0.3151 (0.427)
Past Discovery	-0.4814*** (0.112)	-0.4244*** (0.100)	-0.4477*** (0.122)	-0.4836*** (0.130)	-0.3895*** (0.097)	-0.4685*** (0.106)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.1881 (0.120)	0.0797 (0.098)	0.1000 (0.083)	-0.0845 (0.064)	0.0747 (0.099)	0.0624 (0.172)
Past Discovery	-0.0412 (0.030)	-0.0465 (0.031)	-0.0476 (0.029)	-0.0345 (0.028)	-0.0421 (0.030)	-0.0413 (0.029)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	768	670	572	474	376	282
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of country-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.27 - Natural Resource Discoveries and Civil Conflict Onset - Country Level Analysis

Dependent Variable: Number of Grids Experienced Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0539 (0.077)	0.0379 (0.075)	0.0428 (0.092)	0.1496 (0.128)	0.0687 (0.084)	-0.0452 (0.093)
Past Discovery	0.0363 (0.041)	0.0334 (0.042)	0.0334 (0.041)	0.0268 (0.039)	0.0328 (0.039)	0.0385 (0.039)
Panel B: Effect of Discovering Oilfield						
Discovery	0.3342* (0.193)	-0.2149 (0.150)	0.0651 (0.079)	0.0577 (0.070)	0.0389 (0.059)	-0.0996 (0.081)
Past Discovery	0.2985*** (0.081)	0.3018*** (0.091)	0.2786*** (0.076)	0.2800*** (0.083)	0.2811*** (0.079)	0.2910*** (0.076)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0882 (0.082)	0.0633 (0.080)	0.0382 (0.099)	0.1578 (0.141)	0.0652 (0.091)	-0.0487 (0.103)
Past Discovery	0.0178 (0.040)	0.0125 (0.041)	0.0154 (0.040)	0.0079 (0.038)	0.0147 (0.038)	0.0201 (0.038)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1056	958	860	762	664	566
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of country-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.28: Resource Discoveries and Civil Conflict Onset: Restrict our sample to observations where at least one oilfield discovery was made

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.00033 (0.00021)	-0.00029 (0.00020)	-0.00032 (0.00022)	-0.00034 (0.00023)	-0.00037 (0.00025)	-0.00039 (0.00027)
Past Discovery	-0.00029 (0.00021)	-0.00032 (0.00022)	-0.00034 (0.00024)	-0.00037 (0.00026)	-0.00039 (0.00028)	-0.00041 (0.00029)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.00063 (0.00062)	-0.00066 (0.00064)	-0.00069 (0.00067)	-0.00074 (0.00072)	-0.00079 (0.00076)	-0.00083 (0.00080)
Past Discovery	-0.00059 (0.00058)	-0.00063 (0.00061)	-0.00066 (0.00064)	-0.00071 (0.00068)	-0.00076 (0.00073)	-0.00082 (0.00078)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.00026 (0.00018)	-0.00021 (0.00015)	-0.00022 (0.00016)	-0.00024 (0.00017)	-0.00025 (0.00018)	-0.00027 (0.00019)
Past Discovery	-0.00022 (0.00016)	-0.00023 (0.00017)	-0.00024 (0.00018)	-0.00026 (0.00019)	-0.00028 (0.00021)	-0.00027 (0.00021)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14679	14213	13747	13281	12815	12349
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.29: Resource Discoveries and Civil Conflict Onset: Restrict our sample to observations where at least one oilfield discovery was made

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.003 (0.016)	-0.008 (0.017)	-0.016 (0.012)	-0.029*** (0.007)	-0.004 (0.024)	0.043 (0.035)
Past Discovery	0.004 (0.006)	0.006 (0.006)	0.007 (0.007)	0.007 (0.006)	0.005 (0.006)	0.003 (0.005)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.160* (0.080)	-0.122*** (0.025)	-0.058* (0.034)	-0.058 (0.034)	0.312 (0.345)	-0.017 (0.028)
Past Discovery	-0.064 (0.071)	-0.016 (0.049)	-0.035 (0.063)	-0.035 (0.063)	-0.065 (0.078)	-0.039 (0.063)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.005 (0.014)	-0.002 (0.018)	-0.014 (0.012)	-0.027*** (0.006)	-0.026*** (0.007)	0.046 (0.036)
Past Discovery	0.007 (0.006)	0.007 (0.006)	0.009 (0.007)	0.009 (0.006)	0.008 (0.006)	0.005 (0.005)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1456	1408	1360	1312	1264	1216
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.30: Resource Discoveries and Civil Conflict Onset: Restrict our sample to observations where at least one oilfield discovery was made

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.005 (0.010)	0.001 (0.013)	-0.023*** (0.007)	-0.001 (0.015)	-0.007 (0.014)	0.006 (0.016)
Past Discovery	0.002 (0.006)	0.002 (0.006)	0.005 (0.006)	0.002 (0.006)	0.003 (0.006)	0.002 (0.006)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.012 (0.011)	-0.025 (0.024)	-0.023 (0.024)	-0.021 (0.024)	-0.005 (0.009)	-0.002 (0.007)
Past Discovery	0.009 (0.010)	0.013 (0.014)	0.013 (0.014)	0.012 (0.014)	0.011 (0.012)	0.010 (0.011)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.005 (0.011)	0.003 (0.014)	-0.023*** (0.008)	0.001 (0.016)	-0.007 (0.015)	0.007 (0.017)
Past Discovery	0.001 (0.006)	0.001 (0.006)	0.004 (0.006)	0.001 (0.006)	0.002 (0.006)	0.001 (0.006)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2684	2596	2508	2420	2332	2244
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.31: Resource Discoveries and Civil Conflict Onset: Using only the grids in which at least one conflict event occurs over the sample period (high-conflict-risk grids)

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0163** (0.008)	-0.0126** (0.005)	-0.0139*** (0.005)	-0.0153*** (0.005)	-0.0168*** (0.005)	-0.0182*** (0.004)
Past Discovery	-0.0118** (0.005)	-0.0127** (0.005)	-0.0137** (0.005)	-0.0148*** (0.005)	-0.0159*** (0.005)	-0.0161*** (0.005)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0069*** (0.00062)	-0.0081*** (0.00064)	-0.0093*** (0.00067)	-0.0107*** (0.00072)	-0.0122*** (0.00076)	-0.0138*** (0.00080)
Past Discovery	-0.00059 (0.001)	-0.00063 (0.001)	-0.00066 (0.001)	-0.00071 (0.001)	-0.00076 (0.001)	-0.00082 (0.001)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0069*** (0.008)	-0.0076*** (0.007)	-0.0084*** (0.007)	-0.0093*** (0.007)	-0.0102*** (0.007)	-0.0111*** (0.006)
Past Discovery	-0.0215*** (0.008)	-0.0226*** (0.007)	-0.0240*** (0.007)	-0.0255*** (0.007)	-0.0269*** (0.007)	-0.0265*** (0.005)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4536	4392	4248	4104	3960	3816
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.32: Resource Discoveries and Civil Conflict Onset: Using only the grids in which at least one conflict event occurs over the sample period (high-conflict-risk grids)

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0256 (0.063)	-0.0197 (0.057)	-0.0574 (0.035)	-0.0775* (0.044)	-0.0049 (0.089)	0.0836 (0.106)
Past Discovery	-0.01933 (0.037)	-0.0138 (0.036)	-0.0115 (0.036)	-0.0099 (0.036)	-0.0163 (0.036)	-0.0230 (0.031)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.2241*** (0.073)	-0.1444*** (0.022)	-0.0829** (0.035)	-0.0944** (0.036)	0.4480 (0.397)	-0.0711** (0.035)
Past Discovery	-0.1261 (0.081)	-0.0608 (0.065)	-0.0889 (0.078)	-0.0881 (0.078)	-0.1290 (0.090)	-0.0927 (0.078)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.0092 (0.065)	0.0026 (0.063)	-0.0558 (0.038)	-0.0766 (0.047)	-0.0592 (0.076)	0.0908 (0.112)
Past Discovery	-0.0072 (0.037)	-0.0084 (0.038)	-0.0029 (0.037)	-0.0013 (0.037)	-0.0034 (0.036)	-0.0154 (0.032)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31096	30036	29012	28023	27068	26145
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.33: Resource Discoveries and Civil Conflict Onset: Using only the grids in which at least one conflict event occurs over the sample period (high-conflict-risk grids)

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0267 (0.039)	0.0025 (0.047)	-0.0896*** (0.024)	0.0307 (0.052)	-0.0382 (0.048)	0.0479 (0.061)
Past Discovery	-0.0040 (0.018)	-0.0025 (0.022)	0.0075 (0.020)	-0.0049 (0.018)	0.0007 (0.018)	-0.0058 (0.019)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0479*** (0.008)	-0.2261*** (0.004)	-0.2279*** (0.007)	-0.2298*** (0.011)		0.8554*** (0.026)
Past Discovery	-0.1509*** (0.008)	-0.1767*** (0.007)	-0.1769*** (0.007)	-0.1771*** (0.007)	-0.1532*** (0.008)	-0.0371*** (0.011)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0267 (0.040)	0.0105 (0.046)	-0.0845*** (0.023)	0.0402 (0.052)	-0.0344 (0.049)	0.0099 (0.054)
Past Discovery	-0.0107 (0.019)	-0.0102 (0.021)	0.0004 (0.020)	-0.0124 (0.017)	-0.0061 (0.018)	-0.00950 (0.020)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38228	36925	35666	34450	33276	32142
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.34: Resource Discoveries and Civil Conflict Onset: Buffer zone analysis because as some oilfield or mine discoveries cross grid boundaries

Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0001** (0.00005)	-0.00004 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	0.001 (0.001)	0.0001 (0.0001)
Past Discovery	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001** (0.00006)	-0.0001 (0.0001)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.0001 (0.0002)	0.00001 (0.00002)	-0.00001 (0.00003)	0.00003 (0.00003)	0.00002 (0.00002)	-0.00004 (0.00004)
Past Discovery	-0.0001 (0.0001)	-0.0002 (0.0002)	-0.0002 (0.0002)	-0.0002 (0.0002)	-0.0002 (0.0002)	-0.0002 (0.0002)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0001** (0.00005)	-0.00005 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	0.001 (0.001)	-0.0001 (0.0001)
Past Discovery	-0.00003 (0.0001)	-0.00002 (0.0001)	-0.00002 (0.0001)	-0.00002 (0.0001)	-0.0001** (0.00005)	-0.000 (0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.35: Resource Discoveries and Civil Conflict Onset: Buffer zone analysis because as some oilfield or mine discoveries cross grid boundaries

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0064 (0.007)	-0.0028 (0.007)	0.0053 (0.007)	-0.0043 (0.005)	0.0044 (0.007)	0.0005 (0.006)
Past Discovery	-0.0038 (0.003)	-0.0031 (0.003)	-0.0041 (0.003)	-0.0031 (0.003)	-0.0038 (0.003)	-0.0035 (0.003)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.054* (0.028)	-0.045** (0.021)	-0.013 (0.012)	0.0097 (0.013)	0.029 (0.034)	0.00075 (0.007)
Past Discovery	-0.0082 (0.010)	-0.00085 (0.007)	-0.0037 (0.008)	-0.0062 (0.010)	-0.0085 (0.012)	-0.0051 (0.009)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0046 (0.007)	-0.0011 (0.007)	0.0066 (0.007)	-0.0054 (0.006)	0.0021 (0.007)	0.0005 (0.006)
Past Discovery	-0.0036 (0.003)	-0.0032 (0.004)	-0.0042 (0.003)	-0.0029 (0.003)	-0.0035 (0.003)	-0.0034 (0.003)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.36: Resource Discoveries and Civil Conflict Onset: Buffer zone analysis because as some oilfield or mine discoveries cross grid boundaries

Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.0012 (0.006)	-0.0013 (0.005)	-0.0094** (0.004)	0.0083 (0.006)	-0.0068 (0.004)	0.0035 (0.006)
Past Discovery	0.0001 (0.003)	0.0003 (0.003)	0.0012 (0.003)	-0.0006 (0.003)	0.0007 (0.003)	-0.0001 (0.003)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.020 (0.015)	-0.011 (0.012)	-0.012 (0.012)	0.026 (0.027)	-0.0011 (0.003)	0.012 (0.010)
Past Discovery	0.002 (0.003)	0.004 (0.004)	0.004 (0.004)	0.0002 (0.001)	0.0031 (0.003)	0.0019 (0.002)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.0005 (0.006)	-0.0006 (0.005)	-0.009** (0.004)	0.007 (0.006)	-0.007 (0.005)	0.003 (0.007)
Past Discovery	-0.00009 (0.003)	0.00001 (0.003)	0.0009 (0.003)	-0.0007 (0.003)	0.0005 (0.003)	-0.0003 (0.003)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cell-Specific Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: This table reports the effect of discovering at least one natural resource in a panel of cell-year observations. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.37: Resource Discovery and Civil Conflict Onset: Between-Cell Effects
Dependent Variable: Intrastate Civil Conflict Onset (PRIO-GRID Conflict Dataset)

Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-9.99217*** (0.165)	-9.88875*** (0.173)	-10.06867*** (0.176)	-9.90409*** (0.191)	-9.95843*** (0.178)	-10.10830*** (0.176)
Past Discovery	-9.79241*** (0.159)	-9.79884*** (0.156)	-9.75150*** (0.156)	-9.87807*** (0.144)	-9.76863*** (0.142)	-9.72431*** (0.138)
Panel B: Effect of Discovering Oilfield						
Discovery	-8.20426*** (0.474)	-8.67506*** (0.382)	-9.33092*** (0.371)	-8.38673*** (0.420)	-8.81813*** (0.465)	-8.89384*** (0.370)
Past Discovery	-8.50334*** (0.360)	-8.68739*** (0.361)	-8.66171*** (0.349)	-8.91138*** (0.327)	-8.94575*** (0.314)	-8.95123*** (0.302)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-10.23379*** (0.175)	-10.09510*** (0.186)	-10.23332*** (0.189)	-10.13618*** (0.197)	-10.19136*** (0.179)	-10.36345*** (0.181)
Past Discovery	-10.01432*** (0.168)	-10.02107*** (0.165)	-9.98226*** (0.164)	-10.10128*** (0.153)	-9.97104*** (0.154)	-9.91629*** (0.149)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605163	579411	553659	527907	502155	476403
Sample Period	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008	1950-2008

Notes: In Table 4, we present linear probability model (LPM) estimations corresponding to the between-cell variations in natural resource discovery and internal armed conflict, for a given country in a given year. This table reports the effect of discovering at least one natural resource on intra state civil conflict onset in a panel of cell-year observations using generalized linear model (GLM) estimations by allowing non-linear form of relationship between the dependent and independent variables using logit as the link function. Unfortunately the GLM (logit) estimators do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are robust standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.38: Natural Resource Discoveries and Civil Conflict Onset: Between-Cell Effects
Dependent Variable: Intrastate Civil Conflict Onset (UCDP-GED Conflict Dataset)

Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.05379 (0.704)	0.001 (0.012)	-14.20984*** (0.356)	0.48100 (0.480)	-0.64728 (1.043)	0.50983 (0.532)
Past Discovery	-0.51079*** (0.168)	-0.50310** (0.199)	-0.64495*** (0.173)	-0.46022** (0.180)	-0.55163*** (0.168)	-0.46157*** (0.177)
Panel B: Effect of Discovering Oilfield						
Discovery	-13.31496*** (0.601)	-14.00878*** (1.065)	-14.60325*** (0.945)	-14.47699*** (1.019)	-14.18940*** (0.893)	2.71842*** (0.220)
Past Discovery	0.76714 (0.755)	0.86236 (0.778)	0.92734 (0.761)	0.90075 (0.777)	0.87360 (0.756)	0.20432 (0.752)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.09930 (0.706)	0.15698 (0.547)	-14.17926*** (0.383)	0.62582 (0.474)	-0.53845 (1.044)	0.12517 (0.647)
Past Discovery	-0.48368** (0.189)	-0.46403** (0.224)	-0.61582*** (0.193)	-0.41630** (0.188)	-0.51941*** (0.190)	-0.47460** (0.190)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: In Table 7, we present linear probability model (LPM) estimations corresponding to the within-cell variations in natural resource discovery and internal armed conflict, for a given grid cell in a given year. This table presents between-cell specification to identify the effect of discovering at least one natural resource on intra state civil conflict onset in a panel of cell-year observations. We apply generalized linear model (GLM) estimations by allowing non-linear form of relationship between the dependent and independent variables using logit as the link function. Unfortunately the GLM (logit) estimators do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.39: Natural Resource Discoveries and Civil Conflict Onset: Between-Cell Effects

Dependent Variable: Intrastate Civil Conflict Onset (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.13601 (0.639)	-0.44234 (0.769)	-1.20587 (0.975)	-1.07254 (1.043)	0.16240 (0.834)	-1.07681** (0.544)
Past Discovery	-0.35465* (0.203)	-0.40104* (0.220)	-0.45752** (0.230)	-0.43194** (0.216)	-0.34429 (0.218)	-0.24718 (0.192)
Panel B: Effect of Discovering Oilfield						
Discovery	-13.69671*** (0.628)	-14.85308*** (0.832)	-14.57906*** (0.892)	-14.29653*** (0.900)	2.64003 (2.023)	-13.61183*** (0.817)
Past Discovery	0.67152 (0.540)	0.80472 (0.550)	0.81476 (0.543)	0.80658 (0.545)	-0.03672 (1.126)	0.73593 (0.537)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.20508 (0.628)	-0.30249 (0.777)	-1.11986 (0.979)	-0.98147 (1.048)	-0.47976 (1.104)	-1.17787** (0.548)
Past Discovery	0.32786 (0.221)	0.36267 (0.243)	0.42799* (0.250)	0.40200* (0.235)	0.35710 (0.231)	0.20512 (0.210)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: In Table 8, we present linear probability model (LPM) estimations corresponding to the within-cell variations in natural resource discovery and internal armed conflict, for a given grid cell in a given year. This table presents between-cell specification to identify the effect of discovering at least one natural resource on intra state civil conflict onset in a panel of cell-year observations. We apply generalized linear model (GLM) estimations by allowing non-linear form of relationship between the dependent and independent variables using logit as the link function. Unfortunately the GLM (logit) estimators do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.40: Resource Discoveries and Civil Conflict Incidence: Between-Cell Effects

Dependent Variable: Intrastate Civil Conflict Incidence (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.61685 (0.529)	-0.44734 (0.567)	-0.95521 (0.764)	0.33178 (0.468)	-0.09323 (0.552)	0.31769 (0.448)
Past Discovery	-0.34661** (0.173)	-0.40332** (0.197)	-0.43947*** (0.170)	-0.32678* (0.194)	-0.36629** (0.164)	-0.32986* (0.171)
Panel B: Effect of Discovering Oilfield						
Discovery	-2.50228** (1.040)	-14.27869*** (1.050)	-14.74772*** (0.992)	-14.69127*** (0.992)	-14.37400*** (0.861)	2.60520*** (0.315)
Past Discovery	0.14655 (0.866)	0.34117 (0.809)	0.39884 (0.800)	0.38527 (0.804)	0.35259 (0.787)	-0.30947 (0.768)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.22803 (0.674)	-0.40640 (0.579)	-0.88620 (0.775)	0.44140 (0.454)	-0.02697 (0.566)	0.03083 (0.490)
Past Discovery	-0.36468* (0.202)	-0.41092* (0.233)	-0.44480** (0.203)	-0.32608 (0.219)	-0.37070** (0.188)	-0.36590* (0.195)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: In Table A.11 (online appendix), we present linear probability model (LPM) estimations corresponding to the within-cell variations in natural resource discovery and internal armed conflict, for a given grid cell in a given year. This table presents between-cell specification to identify the effect of discovering at least one natural resource on intra state civil conflict incidence in a panel of cell-year observations. We apply generalized linear model (GLM) estimations by allowing non-linear form of relationship between the dependent and independent variables using logit as the link function. Unfortunately the GLM (logit) estimators do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.41: Natural Resource Discoveries and Civil Conflict Incidence: Between-Cell Effects

Dependent Variable: Intrastate Civil Conflict Incidence (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.32094 (0.654)	-0.50066 (0.484)	-0.27321 (0.341)	-0.70473 (0.519)	0.40180 (0.404)	0.59259 (0.560)
Past Discovery	-0.57404*** (0.216)	-0.63116*** (0.240)	-0.61070*** (0.225)	-0.63422*** (0.219)	-0.54634** (0.220)	-0.53377** (0.233)
Panel B: Effect of Discovering Oilfield						
Discovery	-14.17731*** (0.631)	-15.23341*** (0.826)	-14.65802*** (0.904)	-14.55947*** (0.915)	1.91589* (1.042)	-13.77314*** (0.732)
Past Discovery	0.59095 (0.542)	0.75014 (0.553)	0.71934 (0.546)	0.72245 (0.547)	0.22041 (0.589)	0.64819 (0.534)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.39171 (0.636)	-0.39255 (0.486)	-0.21120 (0.340)	-0.63307 (0.505)	0.21238 (0.400)	0.66407 (0.574)
Past Discovery	-0.57155** (0.232)	-0.62003** (0.262)	-0.60306** (0.243)	-0.62832*** (0.236)	-0.56191** (0.231)	-0.52573** (0.253)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: In Table 8, we present linear probability model (LPM) estimations corresponding to the within-cell variations in natural resource discovery and internal armed conflict, for a given grid cell in a given year. This table presents between-cell specification to identify the effect of discovering at least one natural resource on intra state civil conflict incidence in a panel of cell-year observations. We apply generalized linear model (GLM) estimations by allowing non-linear form of relationship between the dependent and independent variables using logit as the link function. Unfortunately the GLM (logit) estimators do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.42: Natural Resource Discoveries and Civil Conflict Intensity: Between-Cell Effects

Dependent Variable: Intrastate Civil Conflict Intensity (UCDP-GED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	-0.43616 (22.851)	-0.51811 (36.476)	0.58124 (24.959)	0.04404 (39.342)	-0.22738 (43.806)	-0.07335 (40.988)
Past Discovery	-0.10895 (20.854)	-0.05430 (22.664)	-0.17744 (19.808)	-0.11888 (21.651)	-0.09490 (20.388)	-0.10841 (21.306)
Panel B: Effect of Discovering Oilfield						
Discovery	3.93701 (2.155e+10)	-0.25112 (2.254e+10)	-0.33304 (2.358e+10)	-0.32752 (2.478e+10)	-0.25660 (1.758e+10)	1.23859 (1.977e+10)
Past Discovery	-0.32449 (2.530e+10)	-0.25773 (2.503e+10)	-0.24919 (2.475e+10)	-0.24977 (2.536e+10)	-0.25983 (2.448e+10)	-0.40000 (2.182e+10)
Panel C: Effect of Discovering Mineral Resources						
Discovery	-0.53762 (36.518)	-0.53762 (36.518)	0.64498 (23.918)	0.07667 (38.094)	-0.22405 (44.274)	-0.18037 (43.405)
Past Discovery	-0.09099 (20.943)	-0.03785 (22.845)	-0.17085 (20.285)	-0.10816 (21.756)	-0.08167 (20.482)	-0.08549 (21.369)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	235246	225236	215226	205216	195206	185196
Sample Period	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010	1989-2010

Notes: In Table A.12, we present ordinary least squares (OLS) estimations corresponding to the within-cell variations in natural resource discovery and internal armed conflict, for a given grid cell in a given year. This table presents between-cell specification to identify the effect of discovering at least one natural resource on intra state civil conflict intensity in a panel of cell-year observations. We apply Poisson regression model estimations by fitting our specification where the dependent variable is measured as the number of occurrences (counts) of conflict events (conflict intensity) observed in a cell-year. Unfortunately the Poisson regression do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.

Table A.43: Natural Resource Discoveries and Civil Conflict Intensity: Between-Cell Effects

Dependent Variable: Intrastate Civil Conflict Intensity (ACLED Conflict Dataset)						
Outcome at:	(1) t	(2) t + 2	(3) t + 4	(4) t + 6	(5) t + 8	(6) t + 10
Panel A: Effect of Discovering Natural Resource (Oilfield + Minerals)						
Discovery	0.27763 (0.42312e+5)	-1.38215 (0.12856e+5)	-1.21117*** (0.249)	-1.01569*** (0.146)	-0.13121 (0.314)	-0.53523 (0.375)
Past Discovery	-0.57159*** (0.209)	-0.73233*** (0.213)	-0.43803** (0.201)	-0.47460** (0.211)	-0.56366** (0.226)	-0.61994*** (0.229)
Panel B: Effect of Discovering Oilfield						
Discovery	-0.87147 (0.1733e+8)	-0.25112 (0.2266e+8)	-0.86225 (0.2826e+8)	-0.73577 (0.2715e+8)	2.52410 (0.2617e+8)	-0.40768 (0.2466e+8)
Past Discovery	-0.32449 (0.1341e+8)	-0.25773 (0.1348e+8)	-0.24919 (0.1407e+8)	-0.24977 (0.1388e+8)	-0.25983 (0.1615e+8)	-0.40000 (0.1381e+8)
Panel C: Effect of Discovering Mineral Resources						
Discovery	0.33491 (0.39275e+5)	-1.39273 (0.12459e+5)	1.33418*** (0.248)	1.15600*** (0.151)	-0.05613 (0.316)	-0.53954 (0.376)
Past Discovery	0.59976*** (0.210)	0.76557*** (0.215)	0.45195** (0.203)	0.49116** (0.213)	0.60867*** (0.227)	0.64880*** (0.230)
Country x Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171088	163808	156528	149248	141968	134688
Sample Period	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012	1997-2012

Notes: In Table A.12 (online appendix), we present ordinary least squares (OLS) estimations corresponding to the within-cell variations in natural resource discovery and internal armed conflict, for a given grid cell in a given year. This table presents between-cell specification to identify the effect of discovering at least one natural resource on intra state civil conflict intensity in a panel of cell-year observations. We apply Poisson regression model estimations by fitting our specification where the dependent variable is measured as the number of occurrences (counts) of conflict events (conflict intensity) observed in a cell-year. Unfortunately the Poisson regression do not converge when using cell-specific fixed effects and cell-specific time trends. Thus, this table shows results of between-cell specification, for a given country in a given year. Numbers in parentheses are clustered standard errors at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Past discovery is the number of years with discoveries from t-10 to t-1.